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Richmond, VA 23225

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August 5, 2016

Virginia Department of Environmental Quality
Office of Environmental Impact Review
ATTN: Ms. Bettina Sullivan
629 East Main Street – Room 631
Richmond, Virginia 23219

RE: Federal Consistency Certification for the proposed Graham Mineral Reserve Extraction (MRE), Fairfax County, Virginia (DEQ #16-0418, VMRC #16-0418, COE #NAO-2012-01865)

Dear Ms. Sullivan:

This document provides the Commonwealth of Virginia with Vulcan Construction Materials, LLC. Consistency Certification and necessary data and information under Coastal Zone Management Act (CZMA) §307(c)(3)(A) and 15 CFR Part 930, subpart D, for the proposed Graham Mineral Reserve Extraction (MRE) Project (Project).

Vulcan Construction Materials, LLC. certifies that the proposed activity complies with the enforceable policies of Virginia's Coastal Zone Management Program (VCP) and will be conducted in a manner consistent with the VCP.

Project Applicant and Contact

Vulcan Construction Materials, LLC.
ATTN: Walter Beck
5601 Ironbridge Parkway, Suite 201
Chester, VA 23831

Authorization Permits Sought

The Applicant is actively pursuing a Virginia Department of Environmental Quality (DEQ) Section 401 Individual Permit and an Army Corps of Engineers (COE) Section 404 Individual Permit to support the development of the Project.

Project Description

Vulcan is proposing to reconfigure the current mining operation to extract the mineral reserves to the southeast of the current quarry operation. This is the primary purpose of this project. Additionally, the Mineral Reserve Extraction (MRE) project development has been reconfigured to accommodate the secondary purpose of the project which is, a Post Mining Land Use Plan for the quarry to become a reservoir utilized by the Fairfax Water Authority (FWA) to meet the projected demands. The reconfigured quarry will be mined in two phases. Phase I is located in the northern portion of the site. It will be separated from Phase II by a linear rock wall. The

purpose of this phased approach is to allow Vulcan to maximize the extraction of mineral resources, in a safe and efficient manner, while providing FWA with an initial reservoir in 2035 (Phase I) and the total reservoir (Phase I plus Phase II) by 2085.

Site Location

Graham II quarry is located in Lorton, Virginia. The site it bound to the east by Ox Road, to the south and west by Little Occoquan Run, and to the north by Elk Horn Run and Peniwill Drive (see attached Figure 1: Vicinity Map). The Project lies within the Middle Potomac Watershed (Hydrologic Unit Code 02070010) and drains to Elk Horn Run and Little Occoquan River.

Site Description

Vulcan Construction Materials (Vulcan) proposes to expand its quarry pit operations at the Graham II quarry, located on Ox Road in Lorton, Virginia to extract mineral on additional property reserves. Not only will this extend the operational life of this quarry to meet local demands for crushed stone for several decades, but it also will also allow for the creation of a public water reservoir for the Fairfax Water Authority, capable of storing in excess of 15 billion gallons of water.

Due to the central location of the unnamed tributary within the project area, mining activities within 1,967 linear feet of tributary, 0.45 acres of forested wetlands, 0.91 acres of palustrine scrub shrub wetlands, and 0.07 acres of palustrine emergent wetlands will require mitigation. The relocation of the processing plant will also require filling activities in isolated wetlands and 7.79 open water in eastern portions of the project area.

Waters of the U.S., including wetlands in the west and south of the current active pit will be avoided.

Vulcan proposes to preserve a 200-foot wide buffer along 4,145 linear feet of Elk Horn Run, enhancing 400 linear feet of 100-foot buffer along either side of Little Occoquan Run and preserving a variable width buffer along the Occoquan River as depicted on Figure 3. In addition, Vulcan plans to purchase 1,045 stream credits from the Hampstead Mitigation Bank, located within the same Hydrologic Unit Code as the proposed project.

Review of Coastal Resources

As stipulated by VCP, Timmons Group has reviewed the following coastal resources for potential impact:

- **Tidal and Non-tidal Wetland Management** – The jurisdictional waters of the US, including both wetlands and streams, were confirmed by the United States Army Corps Engineers (COE) on September 13, 2012 (2012-01865 Graham Quarry). A map illustrating the jurisdictional waters of the US boundaries identified onsite are shown on the attached Survey Limits of Water of the United States. Wetlands identified onsite consisted of palustrine emergent (PEM) wetlands, palustrine forested (PFO) wetlands, non-isolated palustrine scrub shrub (PSS) wetlands, isolated PSS wetlands, isolated palustrine open water (POW), perennial streams, ephemeral streams, and intermittent streams. No tidal wetlands were identified onsite.

The development of the Project will require unavoidable permanent impacts to 0.34 acres of non-isolated PSS wetlands, 0.57 acres of isolated PSS wetlands, 0.36 acres of PFO wetlands, 5.98 acres of isolated POW, and 1,607 linear feet of stream channel. Proposed permanent wetland and stream impacts are associated with the reconfigured quarry and the need to relocate the existing processing plant. A map showing the location of the jurisdictional impacts is shown on the attached Figure 3: Overview of Proposed Plan and Key Plan.

Detailed information concerning Vulcan's exploration on specific properties is proprietary and confidential business information. The proposed site is of sufficient size, possesses quality stone deposits, and exhibits direct access to State Route 123 without necessitating any further offsite road improvements, which could be a source of related additional environmental effects contributed to creating a new mining site. In addition, this contiguous property would allow for the use of the existing facility's on-site infrastructure. The amount of compensatory mitigation for this project is relatively small, as outlined in other sections of this document. Conversely, the effect on wetlands for this project will be orders of magnitude less, when compared to development of an entirely new and separate quarry site with supporting infrastructure, as well as creating a future water reservoir.

Waters of the U.S., including wetlands in the west and south of the current active pit will be avoided. These avoided areas include approximately 4,470 linear feet of Elk Horn Run, 4,389 linear feet of Occoquan River, 613 linear feet of Little Occoquan Run (LOR), 0.01 acres of palustrine emergent (PEM) wetland, 0.12 acres of palustrine forested (PFO) wetland, 0.08 acres of isolated PFO wetland and 0.02 acres of isolated palustrine scrub/shrub (PSS) wetland.

- The avoided upgradient section of stream that enters the northern end of the project area will feed into a man-made diversion channel and pipe conveyance system. This ditch/pipe system will direct base flow and storm flow to the north and west around the current/future pit area to the Occoquan River. During larger rain events, any flows not handled by the diversion/ pipe will discharge into the quarry pit. In approximately 2035, when extraction activities are projected to cease (for Phase 1), the pipe will be removed and the diversion channel will be redirected to discharge directly into the quarry pit/future reservoir.

- The avoided lower portion of Little Occoquan Creek, between the existing pit and the Occoquan River is a perennial section that carries its own base flow from groundwater inflows. The inherent perennial nature of the lower avoided portion of the stream channel precludes secondary impacts to the lower reaches of the stream.

- Due to the central location of the upper portion of Little Occoquan Creek (Upper) within the project area, mining activities within this tributary and its headwater wetlands will require mitigation. The relocation of the processing plant will also require filling activities in isolated wetlands and open water in the eastern portion of the project area. The following table provides a summary of the effected waters of the U.S and isolated wetlands:

Area	Activity within Wetland/Water Description*	Wetland Area		Stream Length/Area			Apprx. Vol. of Fill below OHW	Cowardin Classification of Wetland/Water	Average Stream Flow	Drainage Area	DEQ Class. of Resource
(1,2, etc.)		s.f.	a.c.	L	W	s.f.	c.y.	(PEM, PSS, etc.)	c.f.s.	sq. mile	
1	EX,NT,PE,V	14,951	0.34				0	PSS			VII
2	EX,NT,PE,V,MC	15,837	0.36				0	PFO			VII
3	EX,NT,PE,IN			1,607	12	19,284	0	R3/R4	<5	<5	III
4	EX,NT,PE,IS,V	4,710	0.11				0	PSS			VII
5	F,NT,PE,SB,IS,NV	260,610	5.98				38,600	POW			n/a
6	EX,F,NT,PE,IS,V	19,911	0.46				0	PSS			VII
Totals		**316,019**	**7.25**	**1,607**		**19,284**	**38,600**				

* Use all that apply: F-fill, EX-excavation, S-Structure, T-tidal, NT-non-tidal, TE-temporary, PE-permanent, PR-perennial, IN-intermittent, EP-ephemeral, SB-subaqueous bottom, DB-Dune/Beach, IS-hydrologically isolated, V-vegetated, NV-non-vegetated, MC-mechanized clearing of PFO

Based on an application of the standard wetland mitigation ratios used in Virginia, Vulcan proposes to mitigate for 1.27 acres of wetlands by the purchase of 2.09 wetland credits from an approved mitigation bank. It is our understanding that palustrine open water will not require compensation. Additionally, in effort to ensure the future water quality of all streams avoided on site and to mitigate for the excavation of 1,607 linear feet of Little Occoquan Run (Upper), Vulcan has assessed, using the Unified Stream Methodology (USM), all avoided onsite streams. Based on this assessment Vulcan has the capability, through preservation of high quality streams and associated riparian buffers as well as heavy buffer plantings, to realize 2,003 stream credits of environmental benefit. Therefore, Vulcan can wholly mitigate for the 1,607 linear feet of stream, which has a USM credit assessment of 1,497 credits, by the protection of these onsite resources. The 2,003 stream credits proposed to mitigate the required 1,497 credits will ensure there will be no net loss of aquatic resource function and value as a result of the proposed project, while also ensuring the protection of avoided onsite resources with the additional benefit of protecting downstream water quality.

- **Fisheries Management** – The project area is within an industrial property owned by Vulcan and therefore does not support an active commercial fishing industry or public recreational fishing activities. Stormwater management on-site will protect downstream fisheries from degradation. Groundwater and stormwater is monitored in accordance with the quarries DMME permit (VDMME Mining Permit 11008AB) administered by the Virginia Department of Mineral Mining and Energy. Therefore, the project should have no affect for shellfish and other aquatic species.

- **Subaqueous Lands Management** – Based on the inspection of the attached USGS Vicinity Map, no subaqueous land of any kind is located on or near the Project. The development of the Project will not result in the destruction of subaqueous lands.

- **Dunes Management** – Based on the inspection of the attached USGS Vicinity Map and past site inspections, there are no sand dunes located on or near the Project. Development of the Project will not result in the destruction or alteration of any sand dunes.

- **Point Source Air Pollution** – The expansion of the quarry should not have any impact on the air quality and open burning will not be necessary for the proposed project. Even though air quality should not be compromised by the proposed project, all activities will be conducted in accordance with regulations for ambient air standards (9VAC 5-30), hazardous air pollution sources (9VAC 5-60), abatement of visible and fugitive dust emissions (9VAC 5-50-60) and open burning (9VAC 5-130 & 9VAC 5-40-5600). During the quarry operations, fugitive dust will be kept to a minimum with the implementation of typical dust suppression techniques. Therefore, no adverse impact is anticipated.

- **Point Source Water Pollution** – All stormwater runoff will be treated prior to discharge off-site in accordance with an approved Stormwater Management Plan and Virginia Pollution Discharge Elimination System permit. The proposed project will improve water quality and reduce both non-point and point source pollution by treating and monitoring stormwater and groundwater on-site in accordance with the VDMME permit (VDMME Mining Permit 11008AB) administered by the Virginia Department of Mineral Mining and Energy.

- **Non-point Source Water Pollution** – The project area is within an industrial property owned by Vulcan and therefore does not support an active commercial fishing industry or public recreational fishing activities. Stormwater management on-site will protect downstream fisheries from degradation. Groundwater and stormwater is monitored in accordance with the quarries DMME permit (VDMME Mining Permit 11008AB) administered by the Virginia Department of Mineral Mining and Energy. Therefore, the project should have no affect for shellfish and other aquatic species.

- **Shoreline Sanitation** – Per the attached USGS Vicinity Map, the Project is not located adjacent to a shoreline; therefore, the development of the Project will not result in a potential risk to shoreline sanitation.

- **Coastal Lands Management** – The Virginia Department of Environmenta1 Quality (VDEQ) administers the Virginia Coastal Zone Management Program, commonly referred to as the Virginia Coastal Program (VCP), to protect and manage Virginia's coastal zone from the shoreline to as far as 100 miles inland on the four tidal rivers of Virginia (the Potomac, Rappahannock, James, and York Rivers). Fairfax County is a member of' Virginia's coastal community due to its location within the Coastal Zone Management Area. The proposed project will be constructed in accordance with the Chesapeake Bay Preservation Act (CBPA) and Fairfax County Ordinance. All Resource Protection Areas will be identified on construction plans. Therefore, no adverse impacts are anticipated. Therefore, proposed projects located in the County are required to be consistent with the VCP.

  The proposed project will be constructed in accordance with the Chesapeake Bay Preservation Act (CBPA) and Fairfax County Ordinance. Resource scientists have assessed the three stream reaches that are located within the project area. These streams are labeled “Elk Horn Run”, “Little Occoquan Run”, and the “Occoquan River” on the enclosed Figures. Elk Horn Run and the Occoquan River rated as perennial streams. The Little Occoquan Run has been assessed as “intermittent” and therefore, no RPA is depicted on this stream reach. Fairfax County has confirmed the resource determinations. Prior to any land disturbance activities within the project area, Vulcan will submit construction plans that depict Fairfax County’s final decision regarding RPA boundaries to

the County and VDCR for approval. Therefore, we anticipate no adverse impacts to the RPA.

- **T&E Species** – An assessment was conducted to identify any protected and/or sensitive species or sensitive areas that may be within the project area. Based on that assessment, portions of the project area were found to be marginal habitat for small whorled pogonia (*Isotria medeoloides*) and a survey for that species was recommended.

  The survey for small whorled pogonia was conducted during July 2015, a report was prepared and submitted for United States Fish and Wildlife Service and Virginia Department of Conservation and Recreation and received concurrence of findings. No small whorled pogonia populations were identified within the project area at that time. Therefore, no adverse impacts to protected species or sensitive coastal management areas are anticipated

- **Cultural Resources** – Vulcan has conducted a Phase I Archaeological Investigation within 83 acres of the project area. Fairfax Water Authority conducted a Phase I Cultural Resource Evaluation on the Grounds of the Former District of Columbia's Medium Security Facility in 1998, where the Griffith Treatment Facility is now located. Based on the results of these surveys, as well as the documentation obtained from the Virginia Department of Historic Resource (DHR) Virginia Cultural Resource Information System (V-CRIS) there will be no effects associated with the proposed project to cultural resources. A summary of the Cultural Resource review is included with the attachments.

By this certification that the Project is consistent with the Virginia Coastal Zone Management Program, Virginia is notified that it has six months from the receipt of this letter and accompanying information in which to concur with or object to Vulcan Construction Materials, LLC certification. Pursuant to 15 CFR Section 930.63(b), if Virginia has not issued a decision within three months following commencement of State agency review, it shall notify Vulcan Construction Materials, LLC, and the federal agency of the status of the matter and the basis for further delay.

The State's concurrence, objection, or notification of review status shall be sent to:

Vulcan Construction Materials L.L.C.
ATTN: Mr. Walter Beck
5601 Ironbridge Parkway
Chester, VA 23831

with a copy sent to:

Todd Preuninger
Timmons Group
1001 Boulders Parkway, Suite 300
Richmond, VA 23325

If you should have any questions, comments, or require additional information, please contact Todd Preuninger at (804) 200-6399 or John Brooks at (804) 200-6458. Thank you for your attention to this project.

Sincerely,

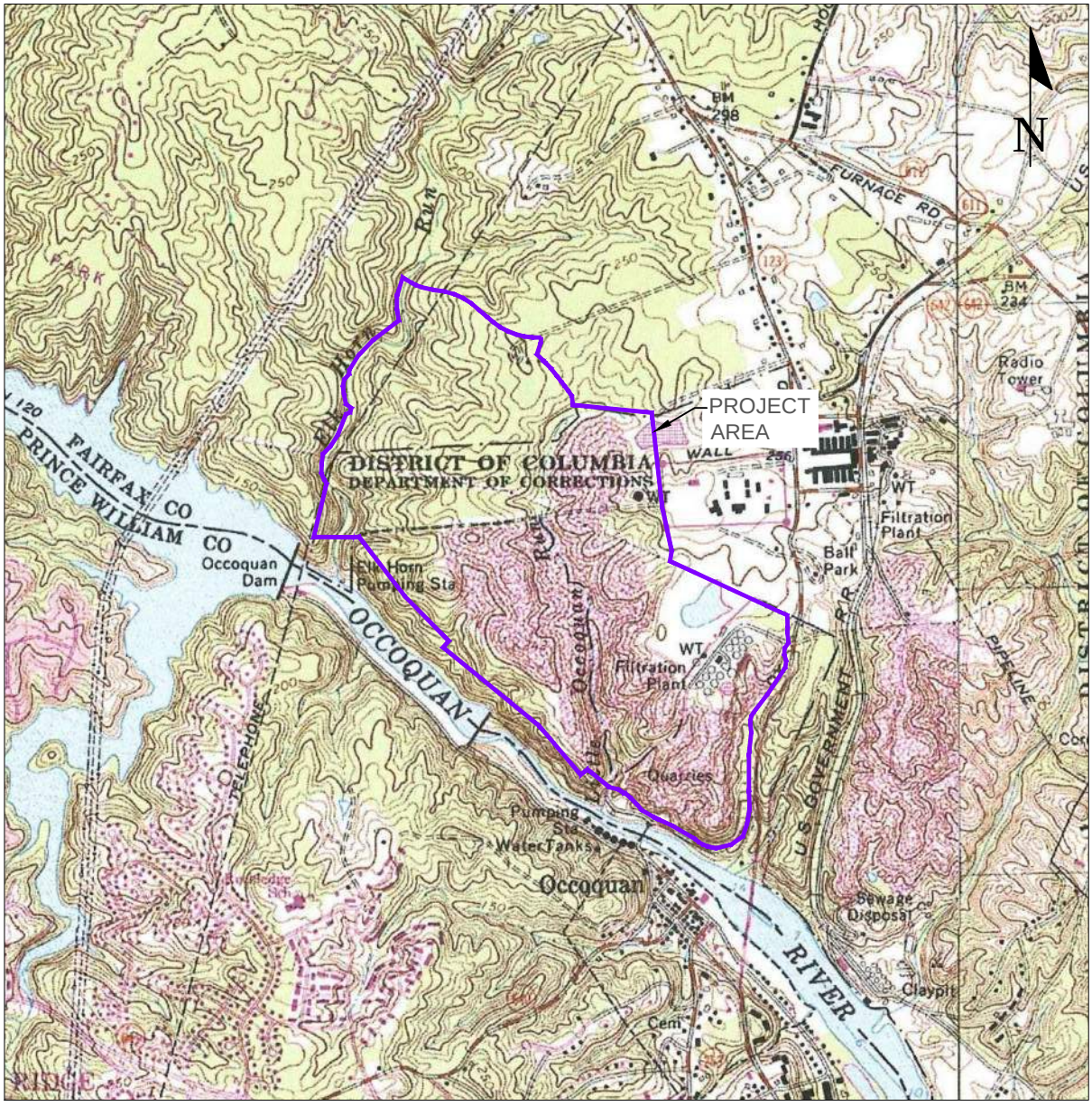
TIMMONS GROUP

Todd Preuninger
Senior Environmental Scientist

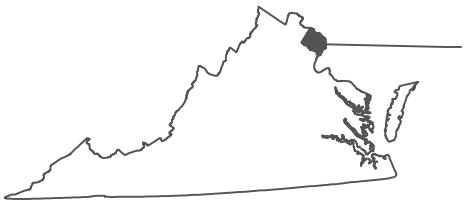
John Brooks
Sr. Environmental Project Manager

Attachments

1) Site Location and Topography Map
2) Existing Conditions Map
3) Survey Limits of Waters of the U.S. Map
4) Jurisdictional Waters of the U.S. Impacts Map
5) FEMA Map
6) Supporting documents for Threatened and Endangered Species database review
7) Summary of Cultural Resource Review



U.S.G.S. 7.5 SERIES QUADRANGLES
FORT BELVOIR, VIRGINIA 1965 (PHOTOREVISED 1983, BATHYMETRY ADDED 1982)
OCCOQUAN, VIRGINIA 1956 (PHOTOREVISED 1984)
SCALE: 1" = 2,000'



PROPOSED FAIRFAX RESERVOIR AT
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VULCAN CONSTRUCTION MATERIALS

NOTE: ALL LOCATIONS ARE APPROXIMATE.

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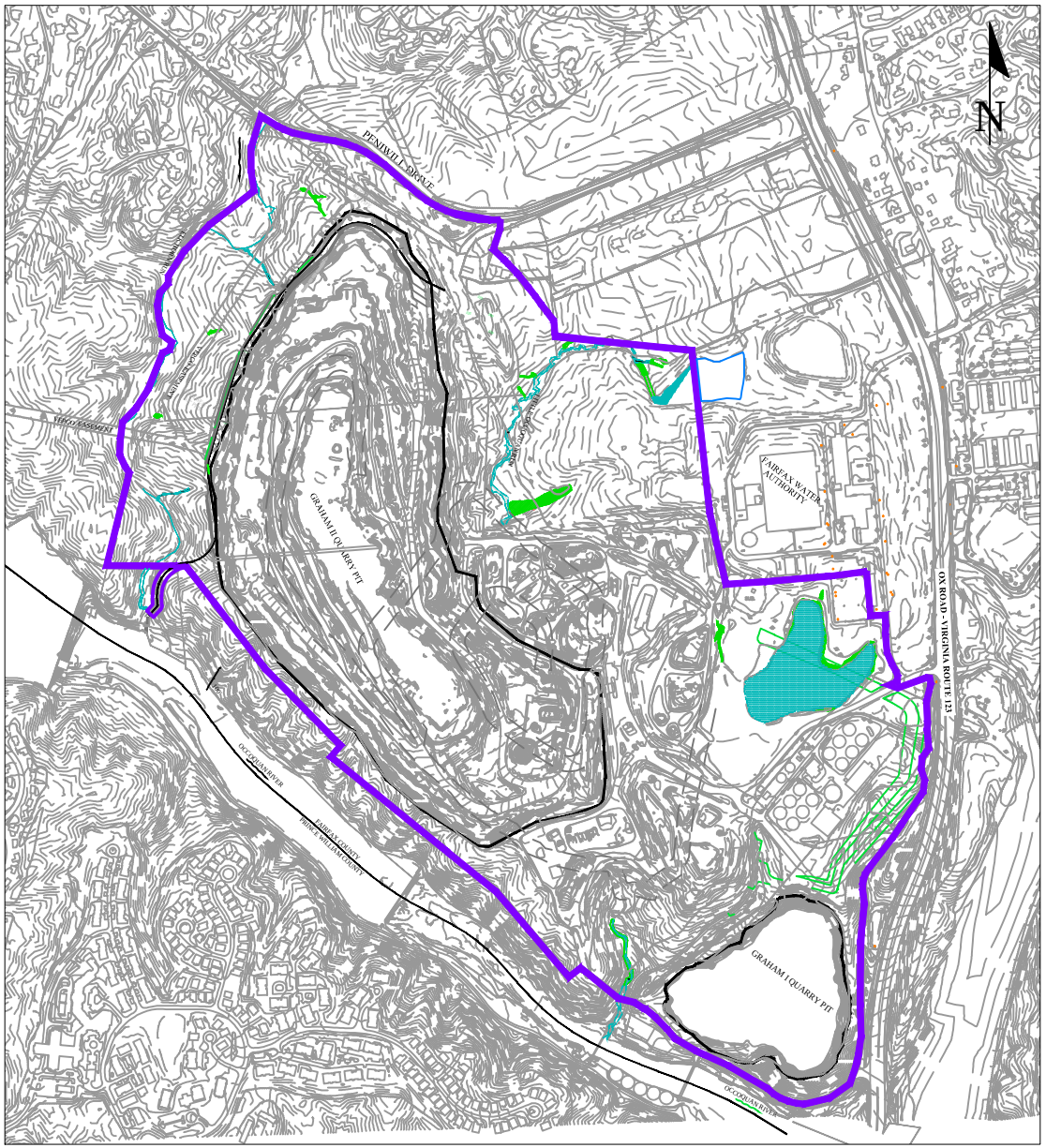
FAIRFAX COUNTY, VIRGINIA
FIGURE 1: SITE LOCATION AND TOPOGRAPHY MAP

SHEET NO.	JOB NO.	SCALE	CHECKED BY	DESIGNED BY	DRAWN BY	DATE
1 OF 1	36736.314	1" = 2000'	J. BROOKS	S. VARGO	B. NORRIS	08/06/2015

DATE	REVISION DESCRIPTION



SCALE: 1" = 1,200'

LEGEND

- PROJECT AREA
- WETLAND BOUNARY
- PALUSTRINE EMERGENT WETLAND (PEM)
- PALUSTRINE FORESTED WETLAND (PFO)
- PALUSTRINE SCRUB/SHRUB WETLAND (PSS)
- OPEN WATER BOUNDARY
- PERENNIAL STREAM CHANNEL
- INTERMITTENT STREAM CHANNEL

PROPOSED FAIRFAX RESERVOIR AT
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VULCAN CONSTRUCTION MATERIALS
FAIRFAX COUNTY, VIRGINIA

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DATE: 08/06/2015
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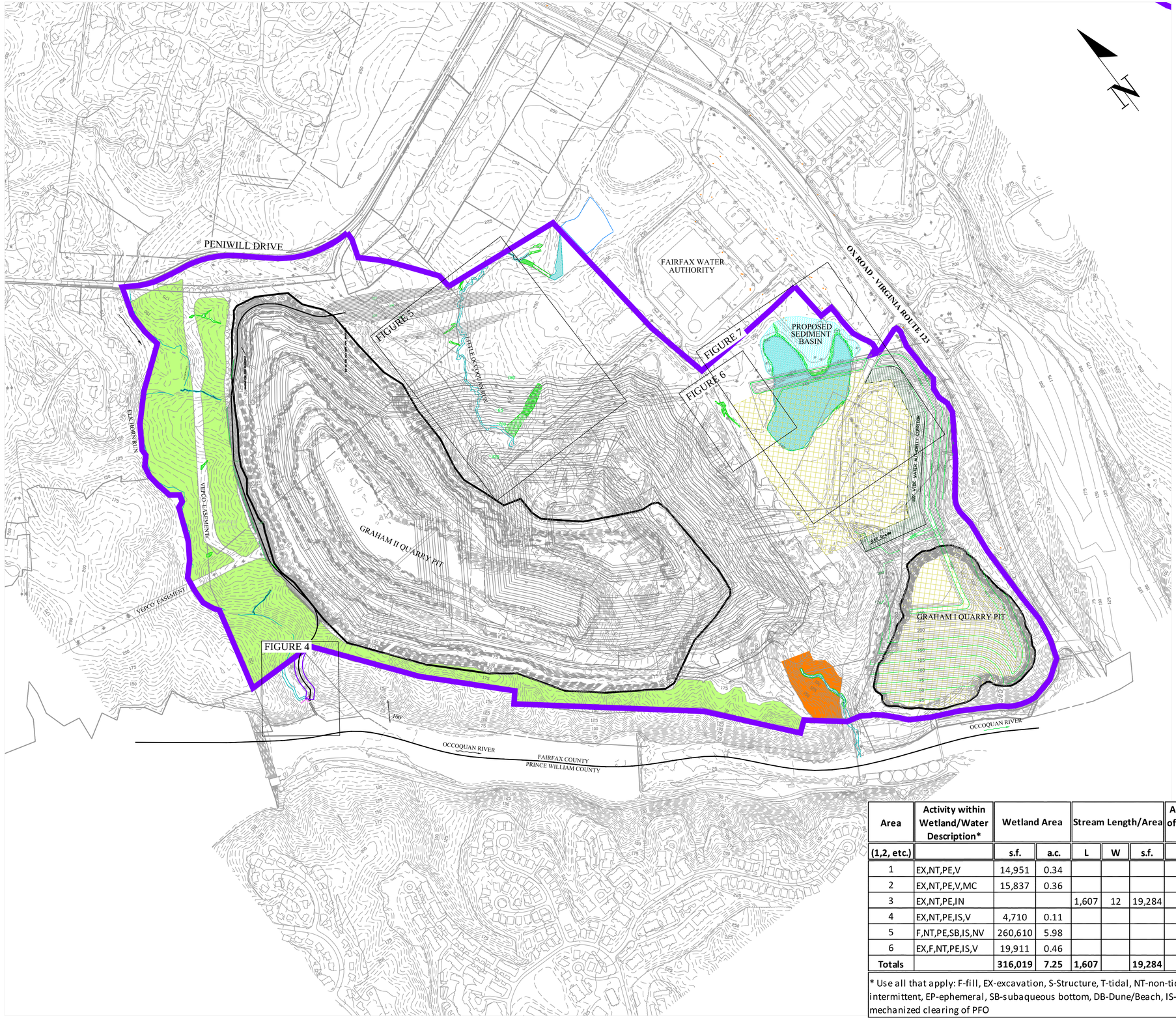
DESIGNED BY: S. VARGO
CHECKED BY: J. BROOKS
SCALE: ----

VULCAN - GRAHAM QUARRY
FAIRFAX COUNTY, VIRGINIA

FIGURE 2: EXISTING CONDITIONS MAP

JOB NO. 36736.314
SHEET NO. 1 OF 1

Y:\80436736.314 Graham Quarry Vulcan\DWG\JPA Figure 1_9\JPA Figures 1_9_TG - BN.dwg | Plotted on 9/15/2015 8:24 AM | by Brianne Norris



LEGEND

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- PALUSTRINE SCRUB/SHRUB WETLAND (PSS)
- OPEN WATER BOUNDARY
- PALUSTRINE OPEN WATER (POW)
- PERENNIAL STREAM CHANNEL
- INTERMITTENT STREAM CHANNEL
- PROPOSED ACCESS ROAD
- FORESTED BUFFER PRESERAVATION (PROVIDED BY VULCAN CONSTRUCTION MATERIALS)
- FORESTED BUFFER PRESERAVATION (PROVIDED BY FAIRFAX WATER AUTHORITY)
- FORESTED BUFFER RESTORATION
- PROPOSED PLANT LOCATION
- OSP — OVERBURDEN STORAGE PILE
- PHASE LINE
- PROPOSED 63" PIPE
- DIVERSION DITCH (BASE FLOW)
- ENLARGEMENT AREA (SEE SUBDEQUENT FIGURES)

PROPOSED FAIRFAX RESERVOIR AT
GRAHAM QUARRY
VULCAN CONSTRUCTION MATERIALS
FAIRFAX COUNTY, VIRGINIA

Area	Activity within Wetland/Water Description*	Wetland Area		Stream Length/Area			Apprx. Vol. of Fill below OHW	Cowardin Classification of Wetland/Water	Average Stream Flow	Drainage Area	DEQ Class. of Resource
(1,2, etc.)		s.f.	a.c.	L	W	s.f.	c.y.	(PEM, PSS, etc.)	c.f.s.	sq. mile	
1	EX,NT,PE,V	14,951	0.34				0	PSS			VII
2	EX,NT,PE,V,MC	15,837	0.36				0	PFO			VII
3	EX,NT,PE,IN			1,607	12	19,284	0	R3/R4	<5	<5	III
4	EX,NT,PE,IS,V	4,710	0.11				0	PSS			VII
5	F,NT,PE,SB,IS,NV	260,610	5.98				38,600	POW			n/a
6	EX,F,NT,PE,IS,V	19,911	0.46				0	PSS			VII
Totals		**316,019**	**7.25**	**1,607**		**19,284**	**38,600**				

* Use all that apply: F-fill, EX-excavation, S-Structure, T-tidal, NT-non-tidal, TE-temporary, PE-permanent, PR-perennial, IN-intermittent, EP-ephemeral, SB-subaqueous bottom, DB-Dune/Beach, IS-hydrologically isolated, V-vegetated, NV-non-vegetated, MC-mechanized clearing of PFO

COMMONWEALTH OF VIRGINIA
Engineer
Lic. No. EN456
PROFESSIONAL ENGINEER

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CHECKED BY: J. BROOKS
SCALE: 1"=350'

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VULCAN - GRAHAM QUARRY
FAIRFAX COUNTY, VIRGINIA

FIGURE 3: OVERVIEW OF PROPOSED PLAN AND KEY MAP

JOB NO. 36736.314
SHEET NO. 1 OF 1

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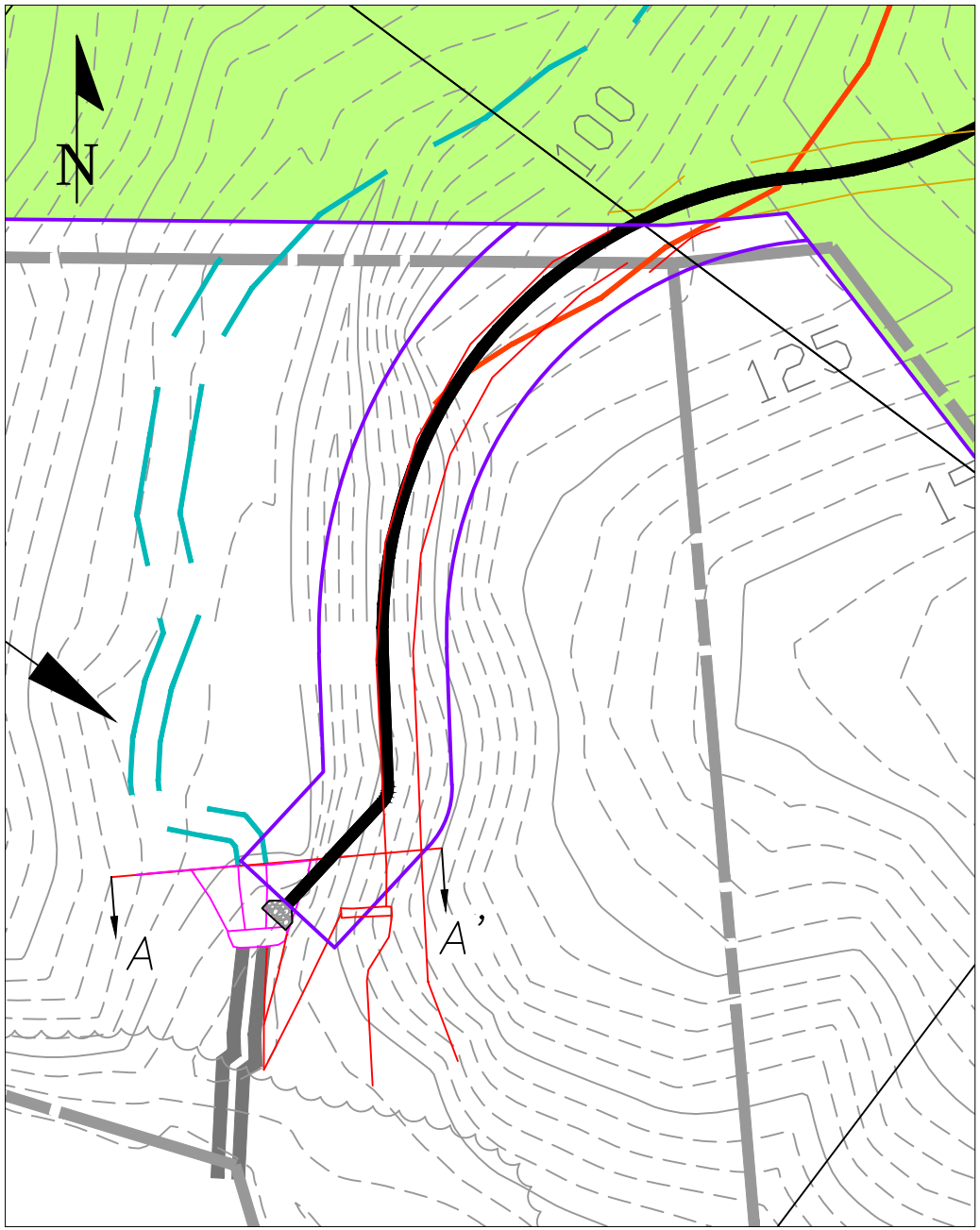

LEGEND

- PROJECT AREA
- WETLAND BOUNARY
- PALUSTRINE EMERGENT WETLAND (PEM)
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- PALUSTRINE SCRUB/SHRUB WETLAND (PSS)
- OPEN WATER BOUNDARY
- PALUSTRINE OPEN WATER (POW)
- PERENNIAL STREAM CHANNEL
- INTERMITTENT STREAM CHANNEL
- TEMPORARY DIVERSION DITCH (50 TO 100

NOTE:

THE DIVERSION DITCH WILL AVOID THE CHANNEL. NO EXCAVATION OR FILL WILL BE CONDUCTED IN THE STREAM OR WETLANDS.

FIGURE 4
AREA A
PROPOSED FAIRFAX RESERVOIR AT GRAHAM QUARRY
VULCAN CONSTRUCTION MATERIALS
FAIRFAX COUNTY, VIRGINIA

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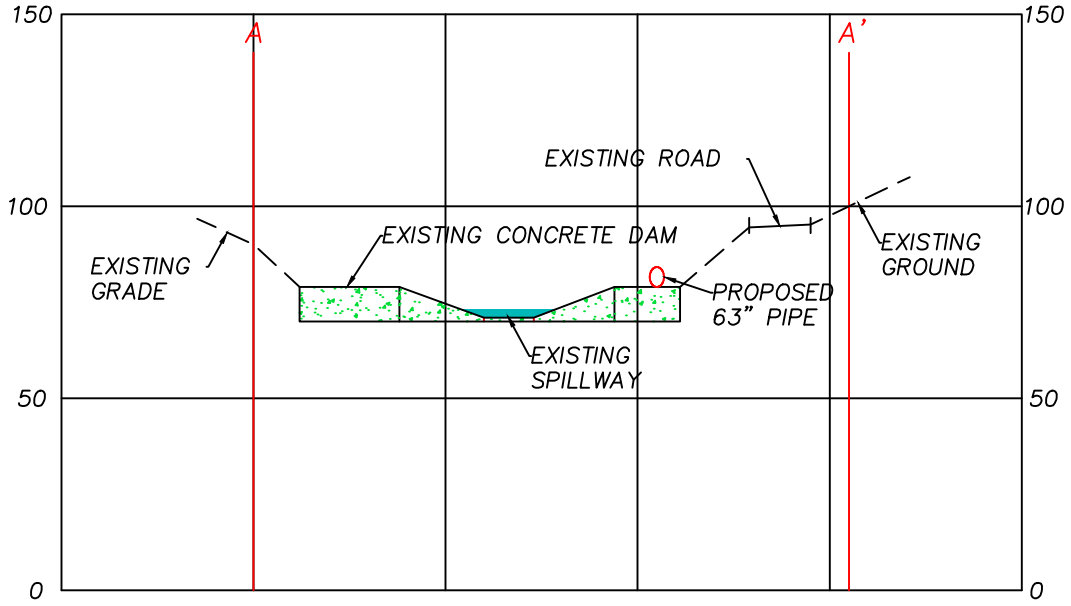
REVISION DESCRIPTION | DATE

DATE 08/07/2015
DRAWN BY B. NORRIS
DESIGNED BY S. VARGO
CHECKED BY J. BROOKS
SCALE 1"=100'

VULCAN - GRAHAM QUARRY
FAIRFAX COUNTY, VIRGINIA
FIGURE 4: AREA A

JOB NO. 36736.314
SHEET NO. 1 OF 1

CROSS-SECTION A TO A'



SCALE: 1" = 50' HORIZONTAL
1" = 50' VERTICAL

PROPOSED FAIRFAX RESERVOIR AT
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DESIGNED BY
S. VARGO

CHECKED BY
J. BROOKS

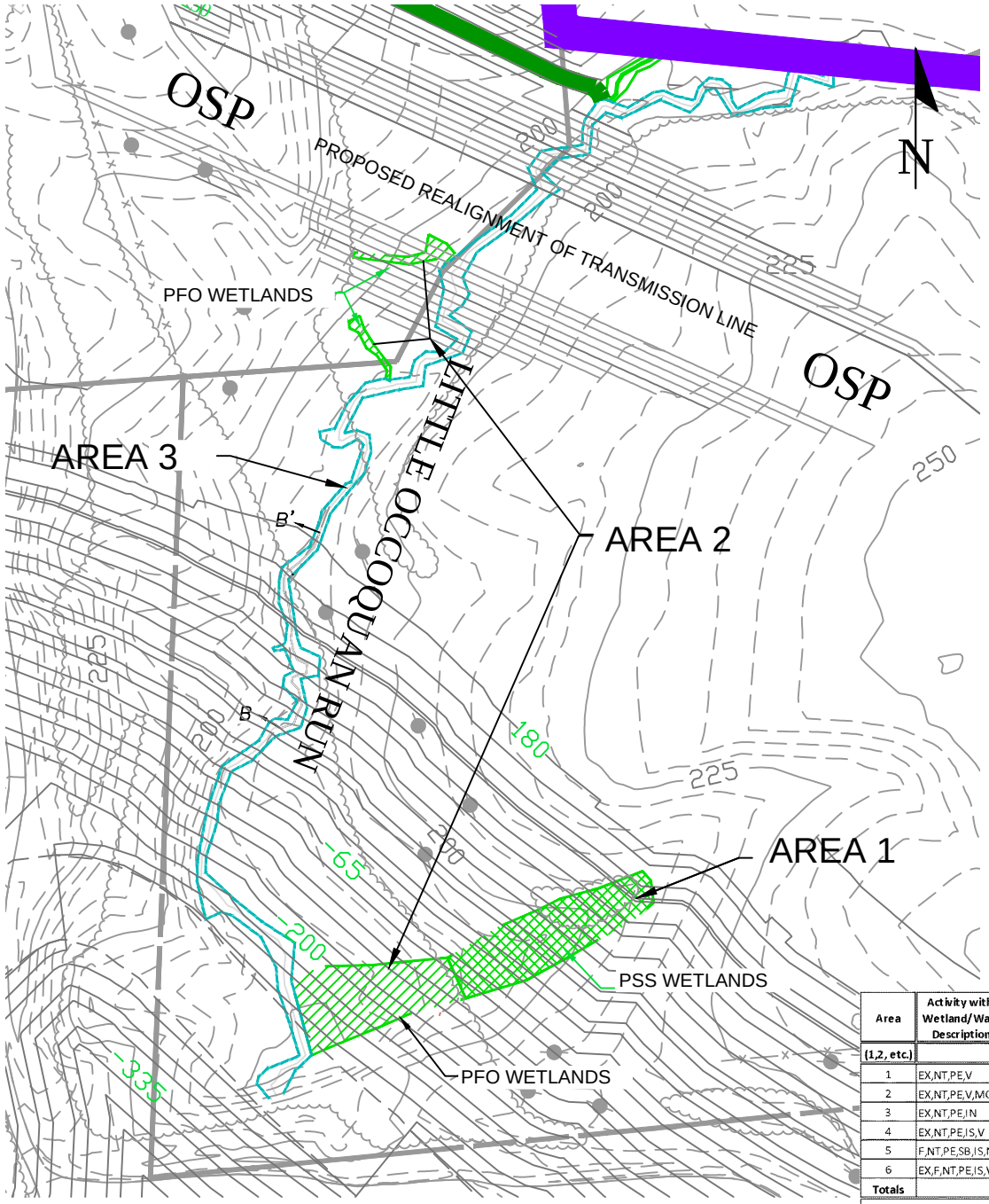
SCALE
1"=50'

VULCAN - GRAHAM QUARRY
FAIRFAX COUNTY, VIRGINIA

FIGURE 4A: CROSS-SECTION A TO A'

JOB NO.
36736.314

SHEET NO.
1 OF 1



SCALE: 1" = 200'

LEGEND

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- PALUSTRINE FORESTED WETLAND (PFO)
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- DIVERSION DITCH (BASE FLOW)

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FAIRFAX COUNTY, VIRGINIA

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4	EX,NT,PE,IS,V	4,710	0.11				0	PSS			VII
5	F,NT,PE,SB,IS,NV	260,610	5.98				38,600	POW			n/a
6	EX,F,NT,PE,IS,V	19,911	0.46				0	PSS			VII
Totals		316,019	7.25	1,607		19,284	38,600				

* Use all that apply: F-fill, EX-excavation, S-Structure, T-tidal, NT-non-tidal, TE-temporary, PE-permanent, PR-perennial, IN-intermittent, EP-ephemeral, SB-subaqueous bottom, DB-Dune/Beach, IS-hydrologically isolated, V-vegetated, NV-non-vegetated, MC-mechanized clearing of PFO

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REVISION DESCRIPTION

DATE

DATE

DRAWN BY
B. NORRIS

DESIGNED BY
S. VARGO

CHECKED BY
J. BROOKS

SCALE
1"=200'

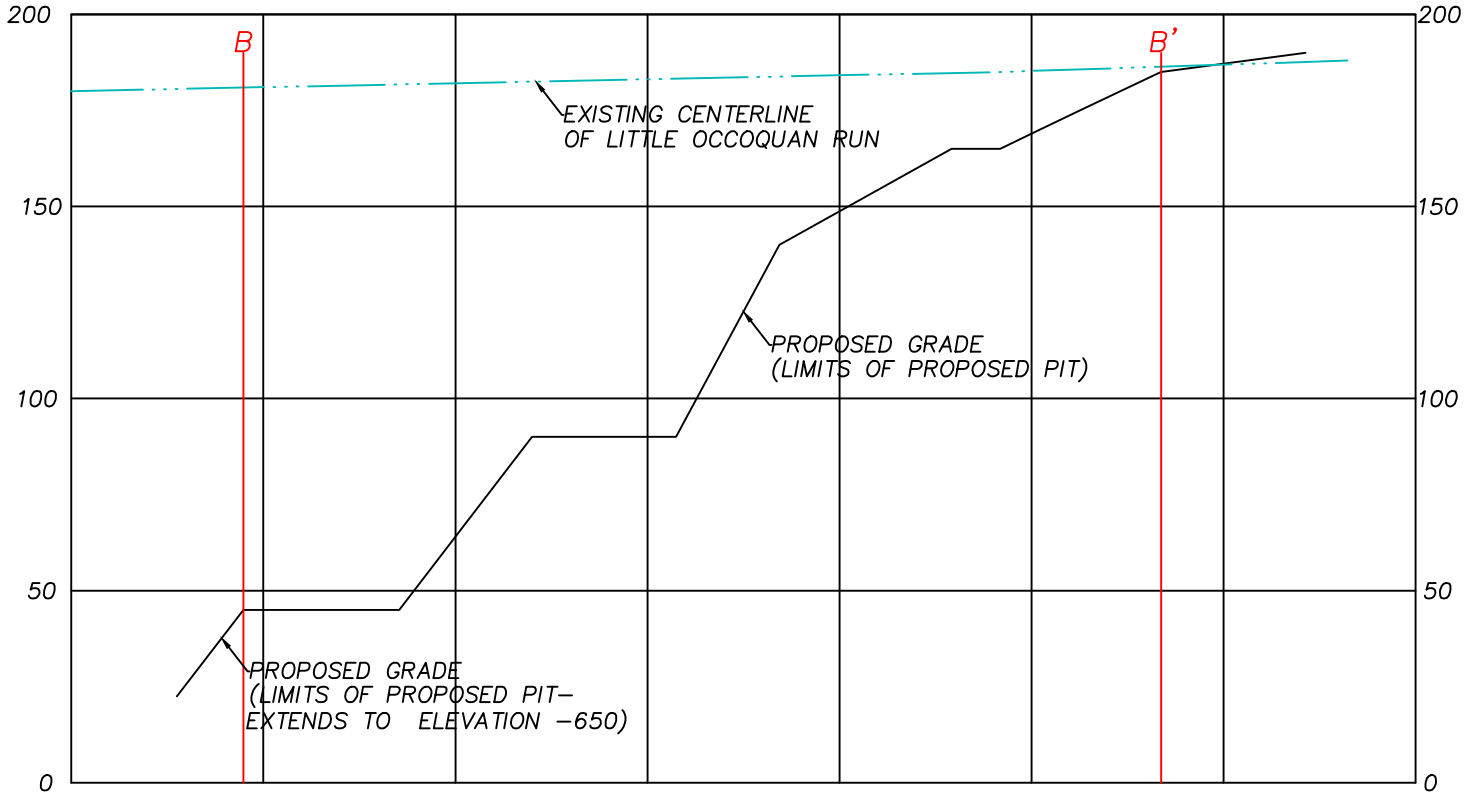
VULCAN - GRAHAM QUARRY
FAIRFAX COUNTY, VIRGINIA

FIGURE 5: AREAS 1, 2, & 3

JOB NO.
36736.314

SHEET NO.
1 OF 1

Y:\80436736.314 Graham Quarry Vulcan\DWG\JPA Figure 1_9\JPA Figures 1_9_TG - BN.dwg | Plotted on 9/15/2015 8:32 AM | by Brianne Norris



SCALE: 1" = 50' HORIZONTAL
1" = 50' VERTICAL

NOTE: ALL LOCATIONS ARE APPROXIMATE.

PROPOSED FAIRFAX RESERVOIR AT
GRAHAM QUARRY
VULCAN CONSTRUCTION MATERIALS
FAIRFAX COUNTY, VIRGINIA

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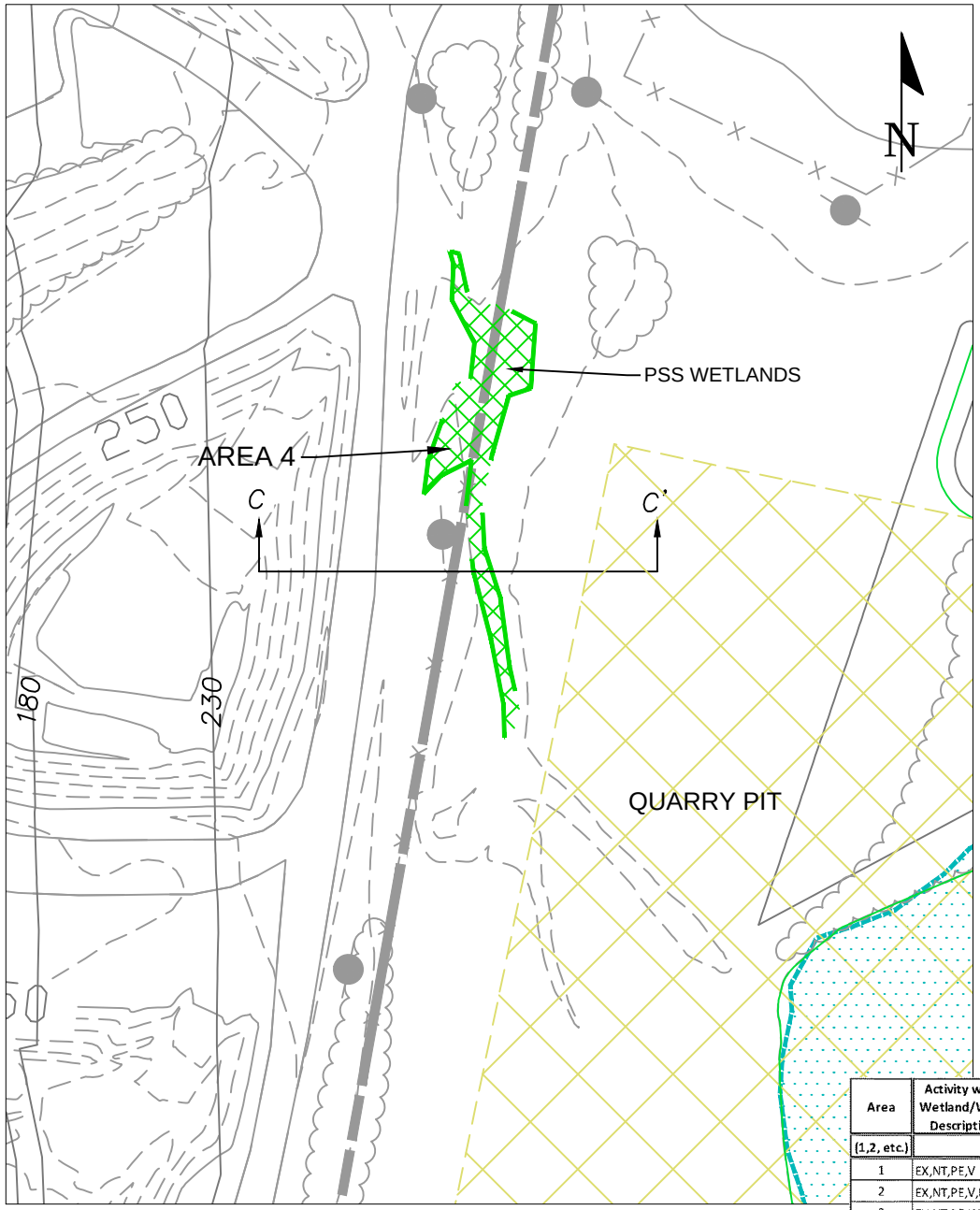
CHECKED BY J. BROOKS
SCALE 1"=50'

VULCAN - GRAHAM QUARRY
FAIRFAX COUNTY, VIRGINIA
FIGURE 5A: CROSS-SECTION B TO B'

JOB NO. 36736.314
SHEET NO. 1 OF 1



SCALE: 1" = 100'

LEGEND

- PROJECT AREA
- WETLAND BOUNDARY
- PALUSTRINE EMERGENT WETLAND (PEM)
- PALUSTRINE FORESTED WETLAND (PFO)
- PALUSTRINE SCRUB/SHRUB WETLAND (PSS)
- OPEN WATER BOUNDARY
- PALUSTRINE OPEN WATER (POW)
- PERENNIAL STREAM CHANNEL
- INTERMITTENT STREAM CHANNEL
- EXISTING PLANT LOCATION

PROPOSED FAIRFAX RESERVOIR AT GRAHAM QUARRY
VULCAN CONSTRUCTION MATERIALS
FAIRFAX COUNTY, VIRGINIA

Area	Activity within Wetland/Water Description*	Wetland Area		Stream Length/Area			Apprx. Vol. of Fill below OHW	Cowardin Classification of Wetland/Water	Average Stream Flow	Drainage Area	DEQ Class. of Resource
(1,2, etc.)		s.f.	a.c.	L	W	s.f.	c.y.	(PEM, PSS, etc.)	c.f.s.	sq. mile	
1	EX,NT,PE,V	14,951	0.34				0	PSS			VII
2	EX,NT,PE,V,MC	15,837	0.36				0	PFO			VII
3	EX,NT,PE,IN			1,607	12	19,284	0	R3/R4	<5	<5	III
4	EX,NT,PE,IS,V	4,710	0.11				0	PSS			VII
5	F,NT,PE,SB,IS,NV	260,610	5.98				38,600	POW			n/a
6	EX,F,NT,PE,IS,V	19,911	0.46				0	PSS			VII
Totals		**316,019**	**7.25**	**1,607**		**19,284**	**38,600**				

* Use all that apply: F-fill, EX-excavation, S-Structure, T-tidal, NT-non-tidal, TE-temporary, PE-permanent, PR-perennial, IN-intermittent, EP-ephemeral, SB-subaqueous bottom, DB-Dune/Beach, IS-hydrologically isolated, V-vegetated, NV-non-vegetated, MC-mechanized clearing of PFO

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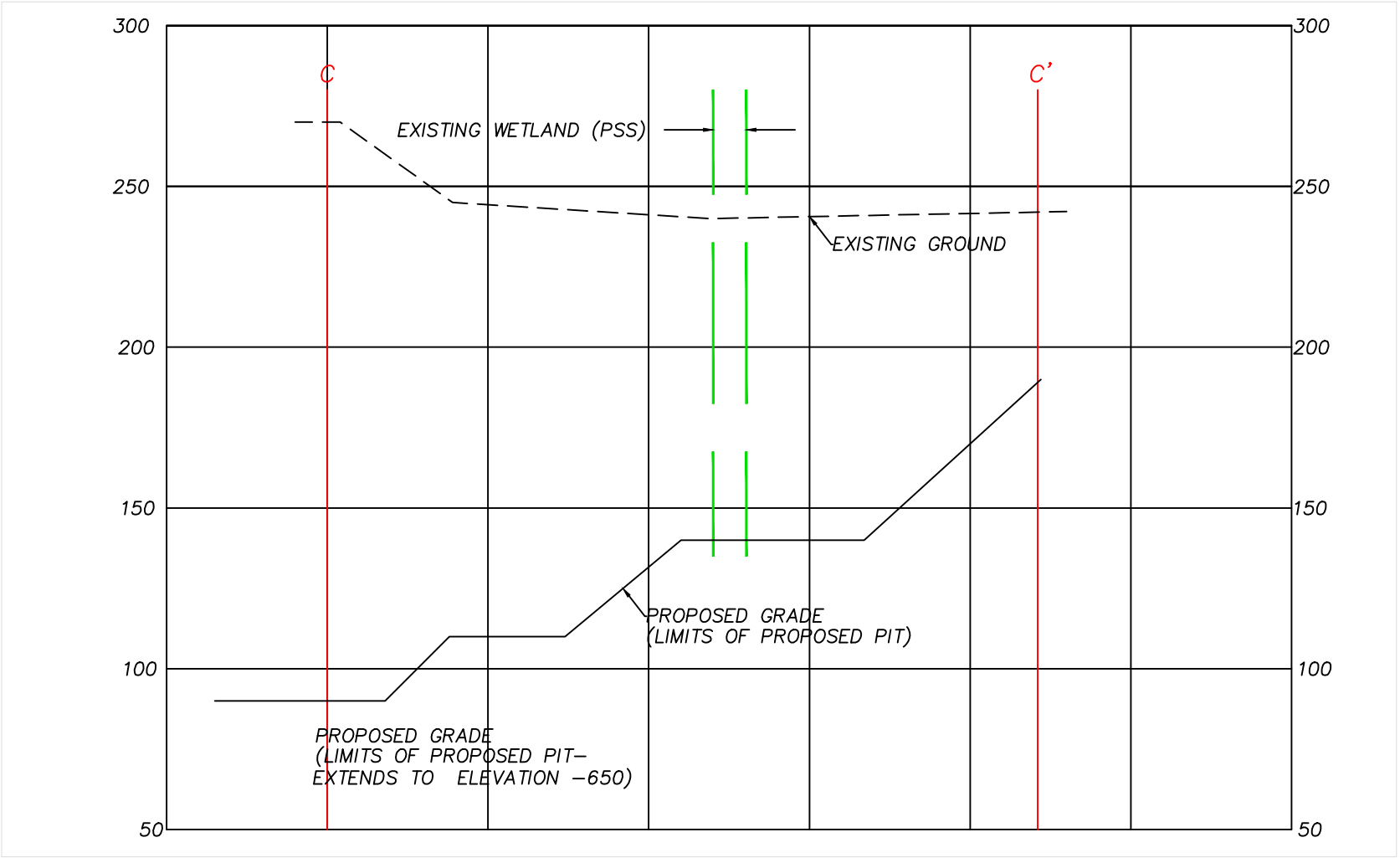
DESIGNED BY S. VARGO
CHECKED BY J. BROOKS
SCALE 1"=100'

VULCAN - GRAHAM QUARRY
FAIRFAX COUNTY, VIRGINIA
FIGURE 6: AREA 4

JOB NO. 36736.314
SHEET NO. 1 OF 1



SCALE: 1" = 50' HORIZONTAL
1" = 50' VERTICAL

NOTE: ALL LOCATIONS ARE APPROXIMATE.

PROPOSED FAIRFAX RESERVOIR AT
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VULCAN CONSTRUCTION MATERIALS
FAIRFAX COUNTY, VIRGINIA

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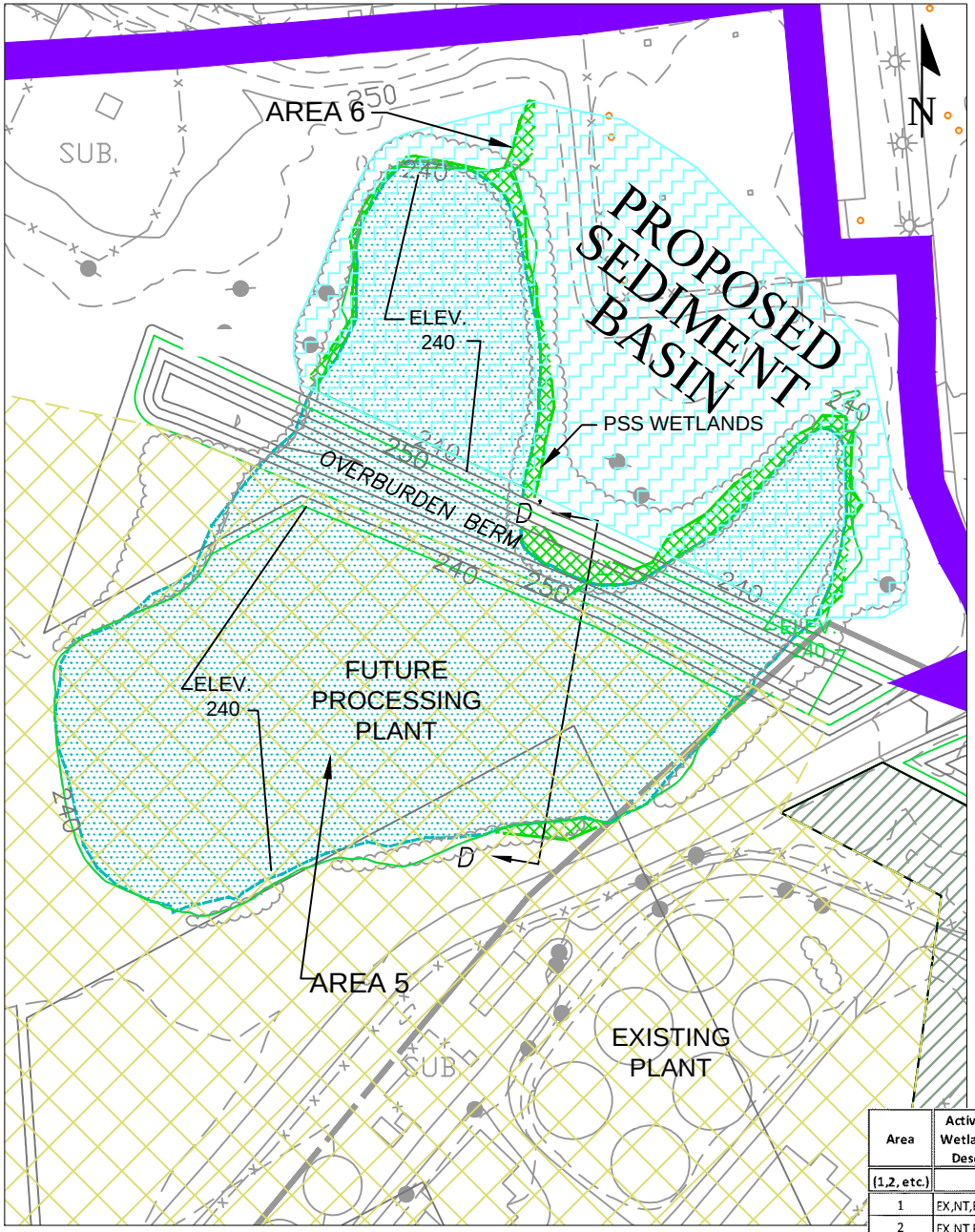
CHECKED BY J. BROOKS
SCALE 1"=50'

VULCAN - GRAHAM QUARRY
FAIRFAX COUNTY, VIRGINIA
FIGURE 6A: CROSS-SECTION C TO C'

JOB NO. 36736.314
SHEET NO. 1 OF 1



SCALE: 1" = 200'

NOTE: ALL LOCATIONS ARE APPROXIMATE.

LEGEND

- PROJECT AREA
- WETLAND BOUNARY
- PALUSTRINE EMERGENT WETLAND (PEM)
- PALUSTRINE FORESTED WETLAND (PFO)
- PALUSTRINE SCRUB/SHRUB WETLAND (PSS)
- OPEN WATER BOUNDARY
- PALUSTRINE OPEN WATER (POW)
- PERENNIAL STREAM CHANNEL
- INTERMITTENT STREAM CHANNEL
- PLANT LOCATION

PROPOSED FAIRFAX RESERVOIR AT
GRAHAM QUARRY
VULCAN CONSTRUCTION MATERIALS
FAIRFAX COUNTY, VIRGINIA

Area	Activity within Wetland/Water Description*	Wetland Area		Stream Length/Area			Apprx. Vol. of Fill below OHW	Cowardin Classification of Wetland/Water	Average Stream Flow	Drainage Area	DEQ Class. of Resource
(1,2, etc.)		s.f.	a.c.	L	W	s.f.	c.y.	(PEM, PSS, etc.)	c.f.s.	sq. mile	
1	EX,NT,PE,V	14,951	0.34				0	PSS			VII
2	EX,NT,PE,V,MC	15,837	0.36				0	PFO			VII
3	EX,NT,PE,IN			1,607	12	19,284	0	R3/R4	<5	<5	III
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5	F,NT,PE,SB,IS,NV	260,610	5.98				38,600	POW			n/a
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Totals		316,019	7.25	1,607		19,284	38,600				

* Use all that apply: F-fill, EX-excavation, S-Structure, T-tidal, NT-non-tidal, TE-temporary, PE-permanent, PR-perennial, IN-intermittent, EP-ephemeral, SB-subaqueous bottom, DB-Dune/Beach, IS-hydrologically isolated, V-vegetated, NV-non-vegetated, MC-mechanized clearing of PFO

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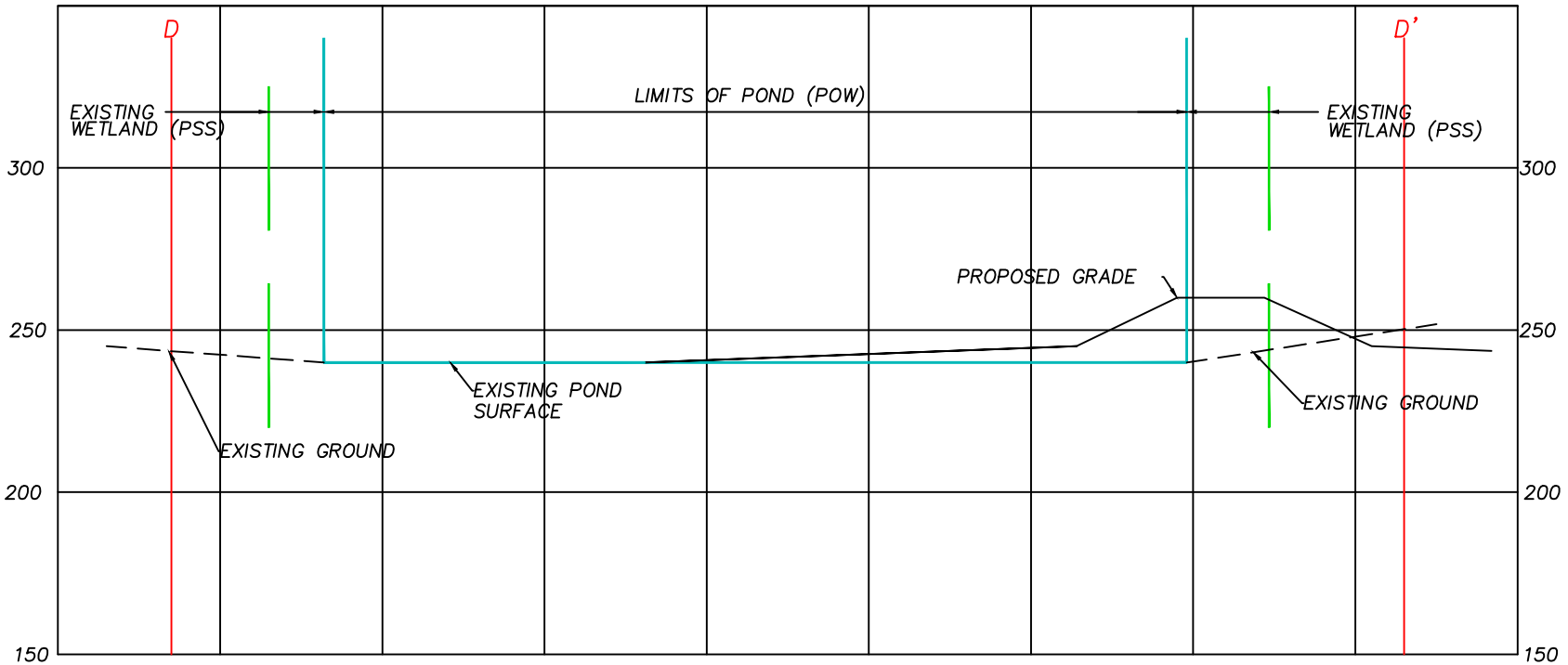
VULCAN - GRAHAM QUARRY
FAIRFAX COUNTY, VIRGINIA
FIGURE 7: AREAS 5 & 6

JOB NO. 36736.314
SHEET NO. 1 OF 1



NOTE: ALL LOCATIONS ARE APPROXIMATE.

SCALE: 1" = 55' HORIZONTAL
1" = 55' VERTICAL

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FAIRFAX COUNTY, VIRGINIA

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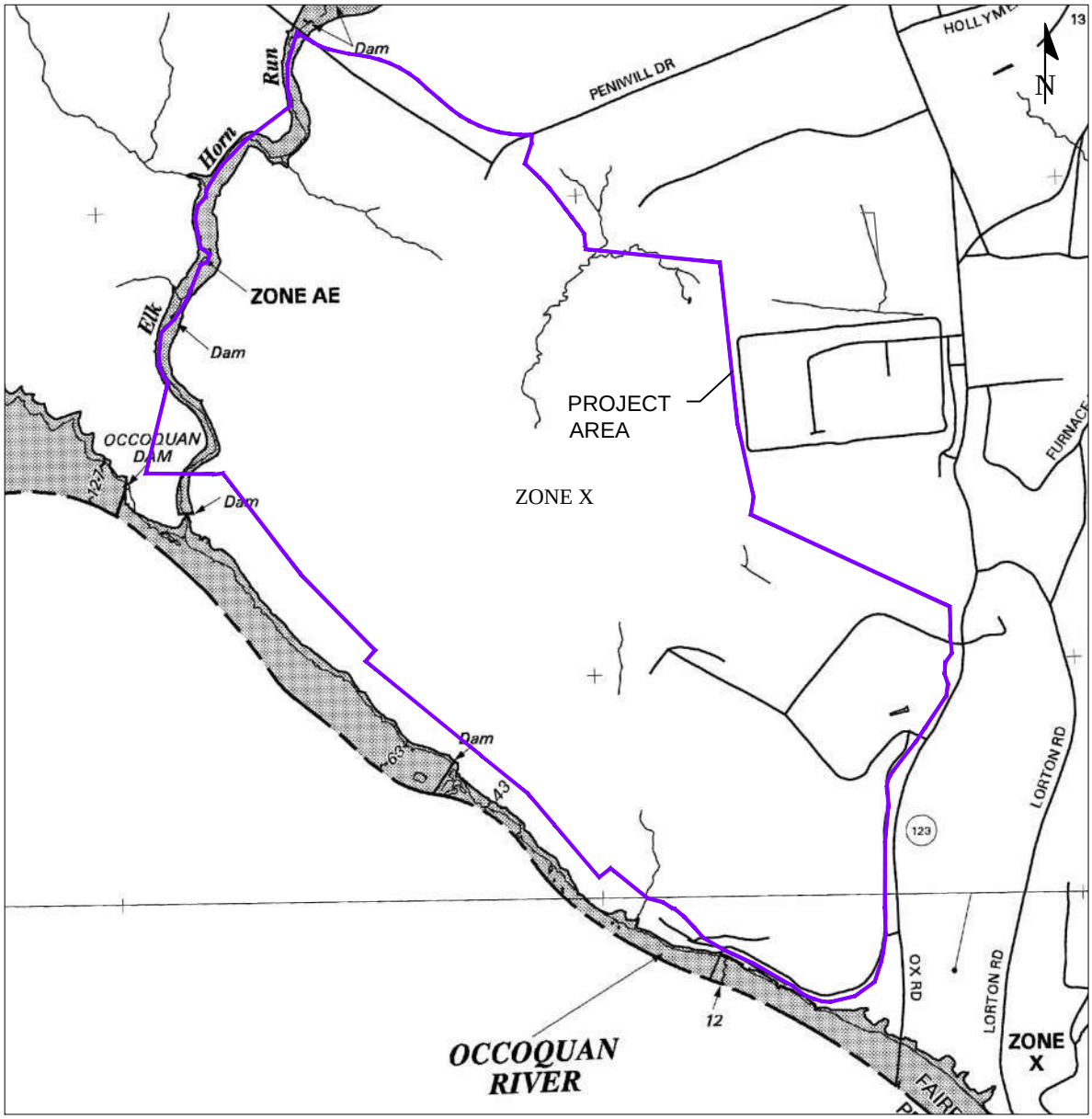
DESIGNED BY S. VARGO
CHECKED BY J. BROOKS
SCALE 1"=55'

VULCAN - GRAHAM QUARRY
FAIRFAX COUNTY, VIRGINIA
FIGURE 7A: CROSS-SECTION D TO D'

JOB NO. 36736.314
SHEET NO. 1 OF 1



NATIONAL FLOOD INSURANCE PROGRAM,
FEMA FLOOD INSURANCE RATE MAP
FAIRFAX COUNTY, VIRGINIA
MAP NUMBERS #51059C0360E, #51059C0370E, #51059C0380E,
AND #51059C0390E (EFFECTIVE DATA: 09/17/2010)
http://fema.gov, accessed date: November 20, 2012
SCALE: 1" = 1,200'

LEGEND
ZONE AE - BASE ELEVATION DETERMINED
ZONE X - AREAS DETERMINED TO BE OUTSIDE
THE 0.2% ANNUAL CHANCE FLOODPLAIN.

PROPOSED FAIRFAX RESERVOIR AT
GRAHAM QUARRY
VULCAN CONSTRUCTION MATERIALS
FAIRFAX COUNTY, VIRGINIA

NOTE: ALL LOCATIONS ARE APPROXIMATE.

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VULCAN - GRAHAM QUARRY
FAIRFAX COUNTY, VIRGINIA
FIGURE 8: FEMA FLOOD INSURANCE RATE MAP

SHEET NO.	JOB NO.	SCALE	CHECKED BY	DESIGNED BY	DRAWN BY	DATE
1 OF 1	36736.314	1"=1200'	J. BROOKS	S. VARGO	B. NORRIS	08/07/2015

DATE	REVISION DESCRIPTION

APPENDIX E-REVIEW FOR PROTECTED SPECIES

Vulcan Construction Materials, LLC
Graham II Quarry Mineral Reserve Extraction
Fairfax County, Virginia
Joint Permit Application (JPA)

THREATENED AND ENDANGERED SPECIES

An Endangered Species Project Review was conducted to gain insight regarding the potential presence of Endangered Species Act (ESA) listed species within or in the vicinity of the Project. The following agencies and associated databases were reviewed:

- U.S. Fish and Wildlife Services (USFWS) – Information, Planning and Consultations system (IPaC)
- Virginia Department of Game and Inland Fisheries (VDGIF) - Virginia Fish and Wildlife Information Service (VaFWIS)
- Virginia Department of Conservation and Recreation (VDCR) – Division of Natural Heritage (DNH) database
- The Center for Conservation Biology – VaEagles Nest Locator

Based on the results of the IPaC review, the following species have the potential to be present within the project area:

- Small Whorled Pogonia (*Isotria medeoloides*)
- Northern Long Eared Bat (*Myotis septentrionalis*)

A recent survey for the Small Whorled Pogonia was conducted by an Approved Surveyor during the optimal survey time did not find any Small Whorled Pogonia within the project limits. The results of this survey corroborate the findings of a survey conducted in 2013. This survey has been provided to the USFWS for review and concurrence and is also provided in Appendix E: Threatened and Endangered Species Information).

Vulcan understands that the Final 4(d) Rule for Northern Long Eared Bat (NLEB) only requires a time of year restriction on clearing trees in areas of known NLEB Hibernacula and maternity roost trees, as documented by the U.S. Fish and Wildlife Service (FWS) or the Department of Game and Inland Fisheries (DGIF). In accordance with current FWS and DGIF databases, no known NLEB inhabited hibernacula or known maternity roost trees are in the vicinity of the project. Therefore, currently no time of year restrictions (TOYR) on clearing of trees is required, as neither exist within the vicinity or close proximity of the project. Should a known maternity roost tree be found within close proximity of the project, Vulcan understands that clearing within 150 feet of the known roost tree is prohibited between June 1 and July 31st of a given year, and clearing outside of that TOYR is permitted by the Final 4(d) Rule.

The online review package also indicates that no critical habitat is present and the closest bald eagle nest is more than 3 miles away. There are no eagle concentration areas in the vicinity of the proposed project.

A completed Species Conclusion Table and corresponding data are attached for review (Appendix E: Threatened and Endangered Species Information)

Species Conclusions Table

Project Name: Graham Quarry – Mineral Reserve Extraction (MRE) Project

Date: 03/17/2016

Species / Resource Name	Conclusion	ESA Section 7 / Eagle Act Determination	Notes / Documentation
Small Whorled pogonia (Isotria medeoloides)	Suitable habitat present, species not present	Not likely to adversely affect	-Survey conducted in 2013 by an approved surveyor with no SWP individuals located. Report submitted to USFWS with concurrence of findings. -Survey conducted in 7/8/2015 by an approved surveyor with no SWP individuals located. Report submitted to USFWS and enclosed.
Northern Long-eared Bat (Myotis septentronalis)	No known hibernacula or known maternity roost sites within the vicinity of the project.	Not likely to adversely affect	DGIF NLEB GIS website does not show known hibernacula or known maternity roost sites within the vicinity of the project.
Critical habitat	No critical habitat present	No effect	
Bald eagle (Haliaeetus leucocephalus)	Unlikely to disturb nesting bald eagles	No Eagle Act permit required	The action area is not within 2,640 to 5,280 feet of a bald eagle nest
Bald eagle (Haliaeetus leucocephalus)	Does not intersect eagle concentration area.	No Eagle Act permit required	The action area is not within 2,640 to 5,280 feet of bald eagle concentration areas.

Species Conclusions Table

Project Name: Graham Quarry – Mineral Resource Extraction (MRE) Project

Date: 08/3/2015

Species / Resource Name	Conclusion	ESA Section 7 / Eagle Act Determination	Notes / Documentation
Small Whorled pogonia (Isotria medeoloides)	Suitable habitat present, species not present	Not likely to adversely affect	-Survey conducted in 2013 by an approved surveyor with no SWP individuals located. Report submitted to USFWS with concurrence of findings. -Survey conducted in 7/8/2015 by an approved surveyor with no SWP individuals located. Report submitted to USFWS and enclosed.
Northern Long-eared Bat (*Myotis septentronalis)*	Suitable brood habitat present	Not likely to adversely affect	Time of year restriction on clearing trees from April 15 to September 15 to be applied.
Critical habitat	No critical habitat present	No effect	
Bald eagle (*Haliaeetus leucocephalus*)	Unlikely to disturb nesting bald eagles	No Eagle Act permit required	The action area is not within 2,640 to 5,280 feet of a bald eagle nest
Bald eagle (*Haliaeetus leucocephalus*)	Does not intersect eagle concentration area.	No Eagle Act permit required	The action area is not within 2,640 to 5,280 feet of bald eagle concentration areas.

U.S. Fish & Wildlife Service

Graham Quarry Mineral Resource Extraction (MRE)

IPaC Trust Resource Report

Generated August 03, 2015 11:43 AM MDT

US Fish & Wildlife Service

IPaC Trust Resource Report

Project Description

NAME

Graham Quarry Mineral Resource Extraction (MRE)

PROJECT CODE

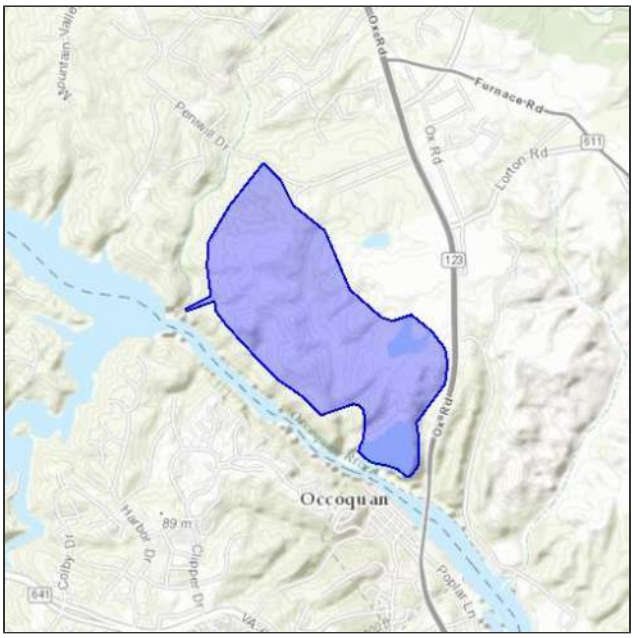
2DKN6-M4NOF-GHFPL-MP3TK-DQ6HOA

LOCATION

Fairfax County, Virginia

DESCRIPTION

No description provided



U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 SHORT LANE
GLOUCESTER, VA 23061
PHONE: (804)693-6694 FAX: (804)693-9032
URL: www.fws.gov/northeast/virginiafield/

Consultation Code: 05E2VA00-2016-SLI-1920 March 17, 2016
Event Code: 05E2VA00-2016-E-02340
Project Name: Graham Quarry Mineral Reserve Extraction

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and

endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: Graham Quarry Mineral Reserve Extraction

Official Species List

Provided by:

Virginia Ecological Services Field Office
6669 SHORT LANE
GLOUCESTER, VA 23061
(804) 693-6694
http://www.fws.gov/northeast/virginiafield/

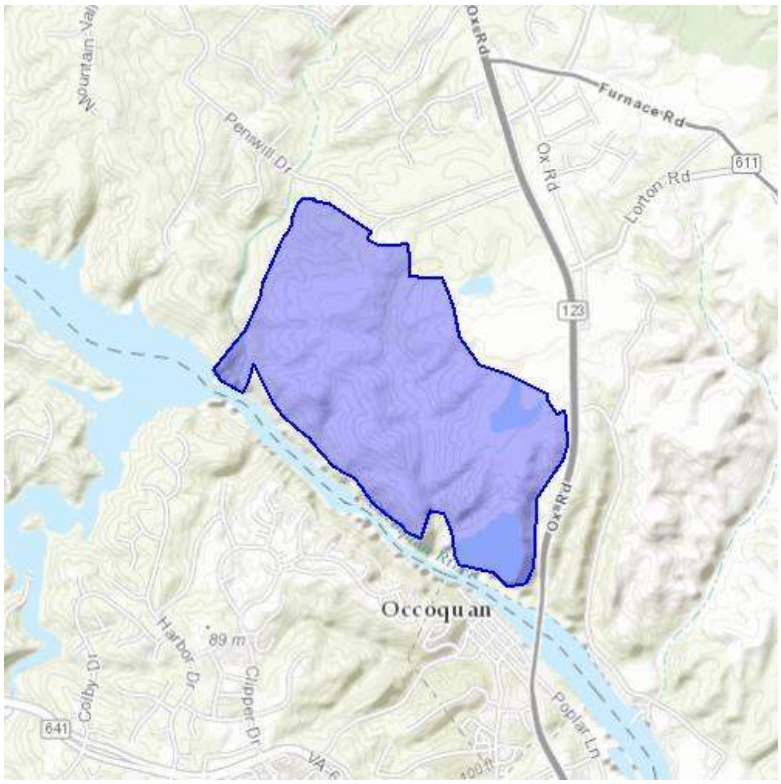
Consultation Code: 05E2VA00-2016-SLI-1920
Event Code: 05E2VA00-2016-E-02340

Project Type: MINING

Project Name: Graham Quarry Mineral Reserve Extraction
Project Description: Continuation of mining activities within permitted mine area.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: The coordinates are too numerous to display here.

Project Counties: Fairfax, VA

Endangered Species Act Species List

There are a total of 2 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Flowering Plants	**Status**	**Has Critical Habitat**	**Condition(s)**
Small Whorled pogonia *(Isotria medeoloides)*	Threatened		
Mammals			
Northern long-eared Bat *(Myotis septentrionalis)*	Threatened		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Appendix A: FWS National Wildlife Refuges and Fish Hatcheries

There are no refuges or fish hatcheries within your project area.

Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the Endangered Species Program and should be considered as part of an effect analysis for this project.

This unofficial species list is for informational purposes only and does not fulfill the requirements under Section 7 of the Endangered Species Act, which states that Federal agencies are required to "request of the Secretary of Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action." This requirement applies to projects which are conducted, permitted or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can be obtained by returning to this project on the IPaC website and requesting an Official Species List from the regulatory documents section.

Flowering Plants

Small Whorled Pogonia Isotria medeoloides **Threatened**

CRITICAL HABITAT

No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q1XL

Mammals

Northern Long-eared Bat Myotis septentrionalis **Threatened**

CRITICAL HABITAT

No critical habitat has been designated for this species.

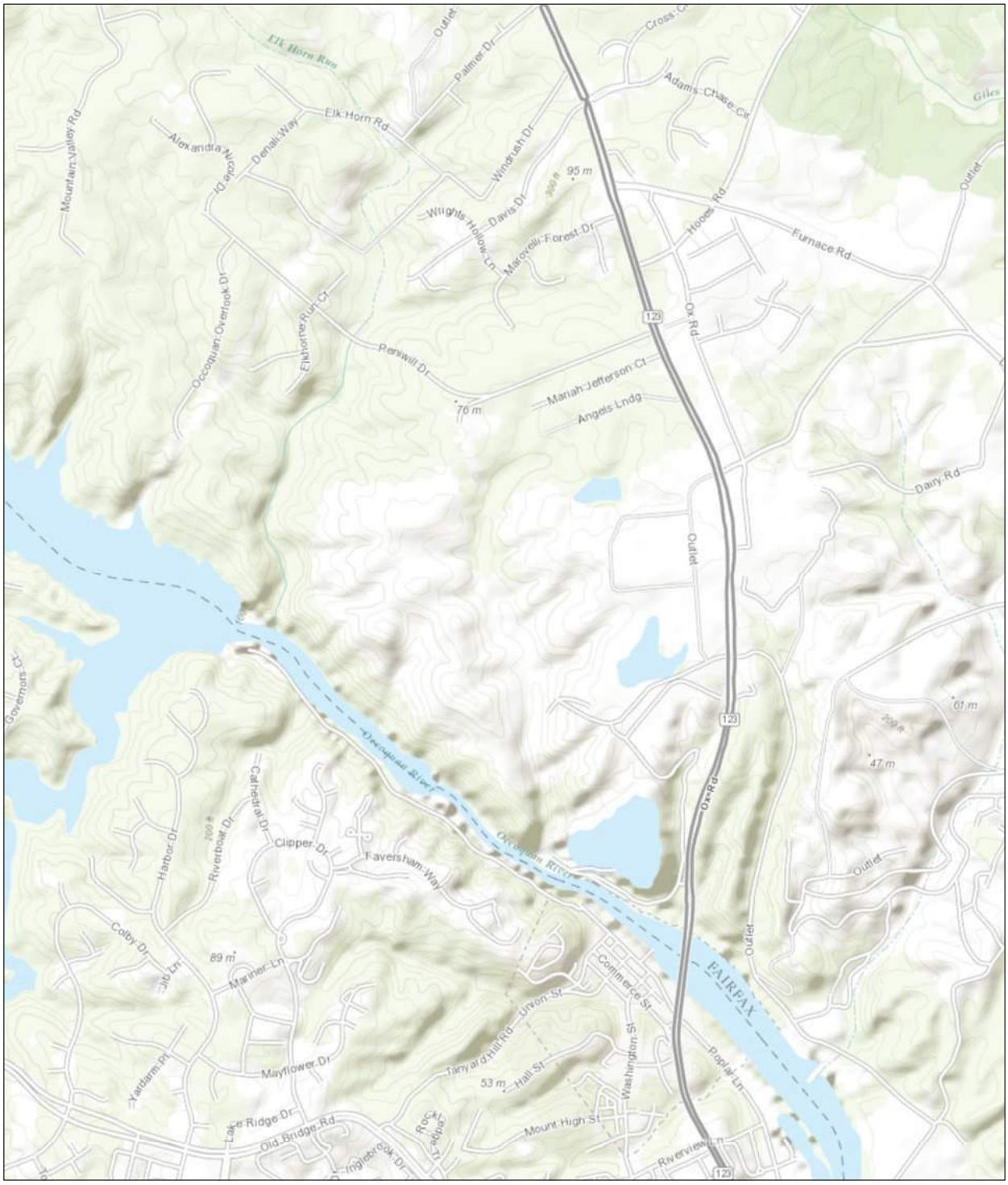
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A0JE

Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

There is no critical habitat within this project area

NLEB Locations and Roost Trees



March 17, 2016

1:18,056

0 0.2 0.4 0.8 mi

0 0.325 0.65 1.3 km

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

VA Dept. Game &an

Esri, HERE, DeLorme, FAO, USGS, EPA, NPS |

Site Location

38,41,33.6 -77,15,51.7
is **the Search Point**

Show Position Rings
(•) Yes ( ) No
1 mile and 1/4 mile at the **Search Point**

Show Search Area
(•) Yes ( ) No
3 Search distance miles radius

Search Point is at map center

Base Map Choices
Topography

Map Overlay Choices
Current List: Anadromous, TEWaters, Position, Search

Map Overlay Legend

T & E Waters
Federal
State

Anadromous Fish Reach
Confirmed
Potential

123 Impediment

Position Rings 1 mile and 1/4 mile at the Search Point

3 mile radius Search Area

back

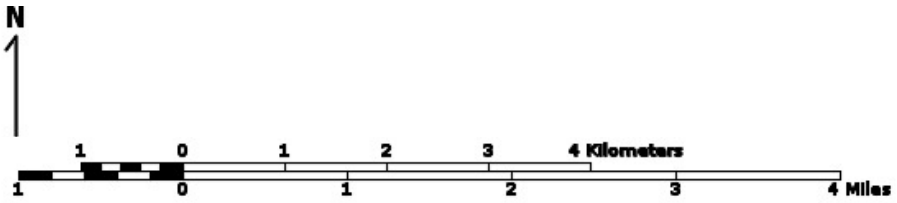
Map Click: Pan | Id | M

Map Scale: In Zoom Out

Refresh Browser Page

Screen Size: Small Size Big

Help



Point of Search 38,41,33.6 -77,15,51.7
Map Location 38,41,33.6 -77,15,51.7

Select **Coordinate System:**
(•) Degrees,Minutes,Seconds Latitude - Longitude
( ) Decimal Degrees Latitude - Longitude
( ) Meters UTM NAD83 East North Zone
( ) Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see Microsoft terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 298270 and top 4289906. Pixel size is 16 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The

VaFWIS Search Report Compiled on 7/31/2015, 4:50:19 PM

Help

Known or likely to occur within a **3 mile radius around point 38,41,33.6 -77,15,51.7** in **059 Fairfax County, 153 Prince William County, VA**

View Map of Site Location

732 Known or Likely Species ordered by Status Concern for Conservation (displaying first 34) (34 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name
010032	FESE	II	Sturgeon, Atlantic	Acipenser oxyrinchus
050022	FT		Bat, northern long-eared	Myotis septentrionalis
060006	SE	II	Floater, brook	Alasmidonta varicosa
030062	ST	I	Turtle, wood	Glyptemys insculpta
040096	ST	I	Falcon, peregrine	Falco peregrinus
040129	ST	I	Sandpiper, upland	Bartramia longicauda
040293	ST	I	Shrike, loggerhead	Lanius ludovicianus
040379	ST	I	Sparrow, Henslow's	Ammodramus henslowii
100155	FSST	I	Skipper, Appalachian grizzled	Pyrgus wyandot
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans
100248	FS	I	Fritillary, regal	Speyeria idalia idalia
040093	FS	II	Eagle, bald	Haliaeetus leucocephalus
100154	FS	II	Butterfly, Persius duskywing	Erynnis persius persius
060029	FS	III	Lance, yellow	Elliptio lanceolata
010038	FS	IV	Alewife	Alosa pseudoharengus
010045	FS		Herring, blueback	Alosa aestivalis
080340	FS		Caddisfly, Buffalo Springs	Ceratopsyche etnieri
030063	CC	III	Turtle, spotted	Clemmys guttata
030012	CC	IV	Rattlesnake, timber	Crotalus horridus
010077		I	Shiner, bridle	Notropis bifrenatus
040372		I	Crossbill, red	Loxia curvirostra
040225		I	Sapsucker, yellow-bellied	Sphyrapicus varius
040319		I	Warbler, black-throated green	Dendroica virens
040306		I	Warbler, golden-winged	Vermivora chrysoptera
040038		II	Bittern, American	Botaurus lentiginosus
040052		II	Duck, American black	Anas rubripes
040029		II	Heron, little blue	Egretta caerulea caerulea

040036		II	Night-heron, yellow-crowned	Nyctanassa violacea violacea
040213		II	Owl, northern saw-whet	Aegolius acadicus
040105		II	Rail, king	Rallus elegans
040186		II	Tern, least	Sterna antillarum
040320		II	Warbler, cerulean	Dendroica cerulea
040304		II	Warbler, Swainson's	Limnothlypis swainsonii
040266		II	Wren, winter	Troglodytes troglodytes

To view **All 732 species** View 732

* FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need;
II=VA Wildlife Action Plan - Tier II - Very High Conservation Need;
III=VA Wildlife Action Plan - Tier III - High Conservation Need;
IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Anadromous Fish Use Streams (2 records)

View Map of All Anadromous Fish Use Streams

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE*	Highest Tier**	
C57	Occoquan river	Confirmed	6	FC	IV	Yes
C62	Pohick creek	Confirmed	3	FC	IV	Yes

Impediments to Fish Passage (4 records)

View Map of All Fish Impediments

ID	Name	River	View Map
1292	I-95	GILES RUN	Yes
1250	LOWER OCCOQUAN	OCCOQUAN R,POTOMAC R	Yes
1249	OCCOQUAN UPPER DAM	OCCOQUAN R,POTOMAC R	Yes
1252	OMISCAL DAM	HOOES RUN	Yes

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

are present. View Map of Bald Eagle Concentration Areas and Roosts

(2 records)

BECAR ID	Observation Year	Authority	Type	Comments	View Map
54	2006 - 2007	VDGIF, Center for Conservation Biology	Summer Concentration Area	Eagle_use Low	Yes
57	2006 - 2007	VDGIF, Center for Conservation Biology	Winter Concentration Area	Eagle_use Low	Yes

Bald Eagle Nests

N/A

Habitat Predicted for Aquatic WAP Tier I & II Species (5 Reaches)

View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species

Stream Name	Tier Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
(20700102)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes
Elk Horn Run (20700102)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes
Occoquan River (20700102)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes
Rocky Branch (20700102)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes
South Run (20700102)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species (3 Species)

View Map of Combined Terrestrial Habitat Predicted for 3 WAP Tier I & II Species Listed Below

ordered by Status Concern for Conservation

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map

040093	FS	II	Eagle, bald	Haliaeetus leucocephalus	Yes
040038		II	Bittern, American	Botaurus lentiginosus	Yes
040105		II	Rail, king	Rallus elegans	Yes

Virginia Breeding Bird Atlas Blocks (8 records)

View Map of All Query Results
Virginia Breeding Bird Atlas Blocks

BBA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE*	Highest Tier**	
53183	Fort Belvoir, CW	37	FS	II	Yes
53181	Fort Belvoir, NW	43		IV	Yes
53185	Fort Belvoir, SW	83	FS	II	Yes
52184	Occoquan, CE	68		II	Yes
52183	Occoquan, CW	39		IV	Yes
52182	Occoquan, NE	59		IV	Yes
52181	Occoquan, NW	64	ST	I	Yes
52186	Occoquan, SE	84		II	Yes

Public Holdings:

N/A

Summary of BOVA Species Associated with Cities and Counties of the Commonwealth of Virginia:

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
059	Fairfax	559	FESE	I
153	Prince William	483	FESE	I

USGS 7.5' Quadrangles:
Occoquan
Fort Belvoir

USGS NRCS Watersheds in Virginia:

N/A

USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV

Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
PL29	Pohick Creek	75	FSST	I
PL47	Occoquan River/Occoquan Reservoir	67	FSST	I
PL48	Occoquan River-Belmont Bay	74	FSST	I
PL49	Neabsco Creek	57	FSST	I
PL50	Potomac River-Occoquan Bay	74	FSST	I

Compiled on 7/31/2015, 4:50:28 PM V673638.0 report=V searchType= R dist= 4828.032 poi= 38,41,33.6 -77,15,51.7

Natural Heritage Resources

Your Criteria

Taxonomic Group: Select All

Watershed (8 digit HUC): 02070010 - Middle Potomac-Anacostia-Occoquan

Subwatershed (12 digit HUC): PL48 - (Lower) Occoquan River-Belmont Bay

Search Run: 7/31/2015 16:38:19 PM

Result Summary

Total Species returned: 3

Total Communities returned: 3

Click scientific names below to go to NatureServe report.

Click column headings for an explanation of species and community ranks.

Common Name/Natural Community	Scientific Name	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences	Virginia Coastal Zone
Middle Potomac-Anacostia-Occoquan							
(Lower) Occoquan River-Belmont Bay							
BIRDS							
King Rail	Rallus elegans	G4	S2B,S3N	None	None	10	Y

Common Name/Natural Community	Scientific Name	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences	Virginia Coastal Zone
BIVALVIA (MUSSELS)							
Brook Floater	Alasmidonta varicosa	G3	S1	None	LE	14	Y
OTHER							
	Colonial Wading Bird Colony	G5	S2	None	None	10	Y
TERRESTRIAL NATURAL COMMUNITY							
Northern Coastal Plain / Piedmont Mesic Mixed Hardwood Forest	*Fagus grandifolia - Quercus (alba, rubra) - Liriodendron tulipifera / (Ilex opaca) / Polystichum acrostichoides Forest*	G5	S5	None	None	26	Y
Northern Coastal Plain / Piedmont Oak - Beech / Heath Forest	*Fagus grandifolia - Quercus (alba, velutina, montana) / Kalmia latifolia Forest*	G4	S3	None	None	16	Y
Coastal Plain Depression Swamp (Willow Oak - Red Maple - Sweetgum	*Quercus phellos - Acer rubrum - Liquidambar styraciflua / Vaccinium*	G3	S2	None	None	15	Y

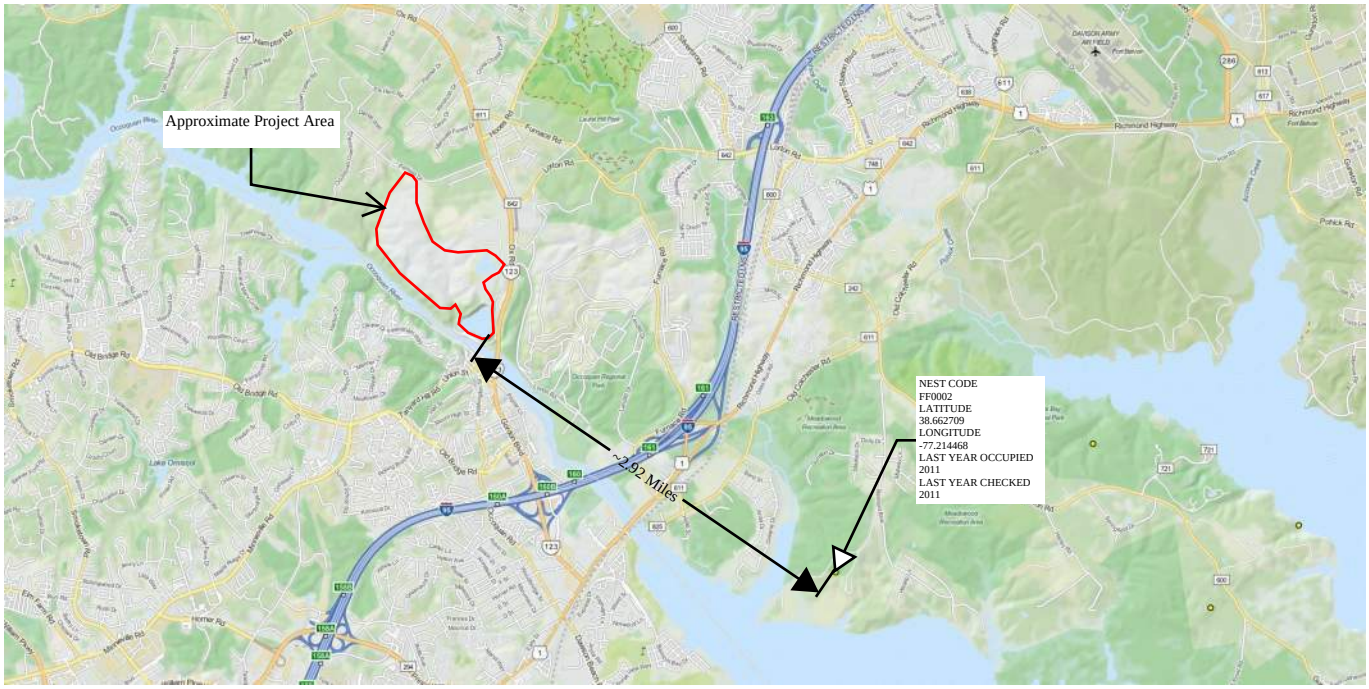
Common Name/Natural Community Type)	Scientific Name	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences	Virginia Coastal Zone
	(formosum, fuscatum) Forest						

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

For Additional Information on locations of Natural Heritage Resources please submit an information request.

To Contribute information on locations of natural heritage resources, please fill out and submit a rare species sighting form.

CCB Mapping Portal



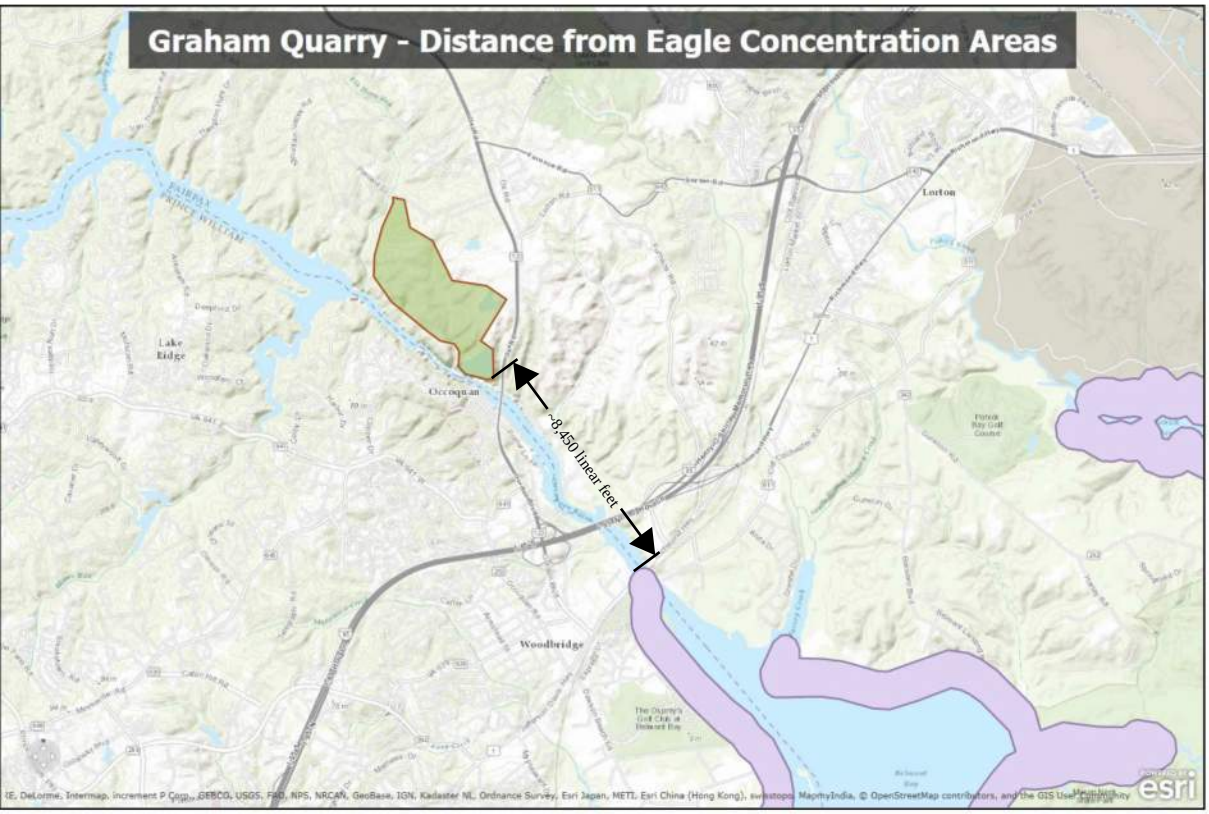
Layers: VA Eagle Nest Locator

Map Center [longitude, latitude]: [-77.23251342773438, 38.68128873323038]

Map Link:
http://www.ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&zoom=14&lat=38.68128873323038&lng=-77.23251342773438&legend=legend_tab_7c321b7e-e523-11e4-a-a0-0e0c41326911&base=Street+Map+%28MapQuest%29

Report Generated On: 08/03/2015

USFWS Bald Eagle Concentration Areas - Virginia



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Direct Dial (804) 200-6458
john.brooks@timmons.com

July 14, 2015

P.N. 36736.314

Ms. Kimberly Smith
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, Virginia 23061

RE: Field Survey for Small Whorled Pogonia
Graham Property
Fairfax County, Virginia

Dear Ms. Smith:

Attached is a field survey report for small whorled pogonia *(Isotria medeoloides)* on the referenced project. I am approved as a small whorled pogonia surveyor by the United States Fish and Wildlife Service and conducted the field survey. As indicated in the enclosed report, no small whorled pogonia plants were observed during the study and habitat was suitable with some marginal, due to the thick understory vegetation, steep slopes, and dense canopy cover.

Timmons Group, respectfully requests confirmation of the findings in this report from your office.I trust that the information provided meets your needs. If you have any questions, I may be reached at the above referenced sources.

Sincerely,

John H. Brooks III, PWD
Environmental Group Leader
Virginia Certified Professional Wetland Delineator, No. 3
USFWS Certified Small Whorled Pogonia Surveyor

/aw

Enclosure

cc: Mr. Chris Ludwig, Virginia Department of Conservation and Recreation
Mr. Walter C. Beck, Vulcan Construction Materials

FIELD SURVEY FOR THE SMALL WHORLED POGONIA GRAHAM PROPERTY FAIRFAX COUNTY, VIRGINIA

Prepared for:
Vulcan Construction Materials, LP
5601 Iron Bridge Parkway
Chester, Virginia 23831

P.N. 36736.314

JULY 15, 2015

FIELD SURVEY FOR THE
SMALL WHORLED POGONIA
GRAHAM PROPERTY
FAIRFAX COUNTY, VIRGINIA

PREPARED FOR:

Vulcan Construction Materials, LP
5601 Iron Bridge Parkway
Chester, Virginia 23831

July 15, 2015
Timmons Group Job No. 36736.314

John H. Brooks, III, PWD
Environmental Group Leader
VA Certified Professional Wetland Delineator, No. 3
USFWS Certified Small Whorled Pogonia Surveyor

Dan Cox, PWD
Environmental Scientist

Miriam Minich
Environmental Technician

Table of Contents

1.0 Executive Summary

On behalf of Vulcan Construction Materials (Vulcan) of Chester, Virginia, Timmons Group of Chesterfield, Virginia presents the results of an investigation conducted to identify and record the presence or absence of the federally protected small whorled pogonia (*Isotria medeoloides*) within portions of the Graham Property. Mr. John H. Brooks III, who is approved as a small whorled pogonia surveyor by the United States Fish and Wildlife Service (USFWS), conducted the field survey. This report is provided for the sole use of Vulcan, USFWS, the United States Army Corps of Engineers (USACOE) and their designated representatives. Use of this report by any other parties will be at the risk of the party. Timmons Group disclaims liability for any use or reliance by other parties.

The small whorled pogonia is the only North American orchid listed as a federally protected endangered species. Historically, its range has covered states; from Michigan to New England and south. However, the small whorled pogonia is an infrequently observed native orchid. Small whorled pogonia may lie dormant for several years to as many as ten years, before reappearing. Both natural and man-made factors are thought to be involved in influencing the dormancy period, including the amount of precipitation, climatic variations, deer and insect herbivory, and changes in the amount of light resulting from clear cutting and natural successional regressions.

Portions of the Graham property have the potential to support habitat for the federally listed threatened plant species, small whorled pogonia. Timmons Group scientists identified three study areas, within the Graham Property, totaling approximately 49.5 acres, as potential suitable habitat for small whorled pogonia were identified on the property. Intensive searches were conducted within all three study areas (Figure 2). No small whorled pogonia plants were identified during the 2013 field survey for the Graham property.

2.0 Species Description

2.1 Species Characteristics

The small whorled pogonia (*Isotria medeoloides*) is a scapose perennial herb growing from slender, hairy, fibrous roots that radiate from a crown of horizontal rootstock. The stem is 9.5 to 25 cm (3.7 to 9.8 in) tall, and is robust, hollow, smooth, dusty green and glaucous. The leaves are drooping, dusty green, and glaucous, elliptic to elliptic-obovate, 2 to 8.5 cm (0.8 to 3.3 in) long, 1.1 to 4 cm (0.4 to 1.5 in) wide, and borne in a single whorl of 5 to 7 at the apex of the stem. The flowers are yellowish green, with oblanceolate to oblong-elliptic petals, with a length of 1.7 cm (0.67 in), 3 mm (0.12 in) wide with a rounded to obtuse apex where the petals are almost white at the lip and are crested with pale green. The flower extends from the center of the whorled leaves with flowering occurring between early May and June. The fruit is an erect ellipsoid-cylindrical capsule approximately 1.5 to 3 cm (0.6 to 1.2 in) long.

2.2 Species Habitat

The small whorled pogonia generally occurs in mature, deciduous upland forests on terrain that is nearly level or gently to moderately sloping in northerly and/or easterly directions. In exceptional instances, the small whorled pogonia can occur on steep slopes or slopes of a southerly exposure. The forest habitat consists of second and third generation deciduous tree species in the canopy and where the under story is moderately open and sunlight mottles or flecks play on the forest floor**.** In Virginia, most small whorled pogonia colonies occur on acidic sandy loam soils having a pH of 4.3 to 5.5 and that are considered as having a low to very low nutrient content (Ware, 1991). The small whorled pogonia is also strongly associated with white oaks (*Quercus alba*) and dead hickory (*Carya* spp.) (Personal communications with D. Ware and personal observations of R. Smiley). In general, areas of southerly and westerly facing slopes, and areas containing predominately pine species (*Pinus* spp.) can be eliminated as potential habitat for the small whorled pogonia (Ware, personal communications, 1994).

2.3 Life History

Winter dormancy of the shoot buds begins to break in March to April. The plant generally stays in bloom longer than one week but less than two weeks, and flowering is synchronized so that the total flowering period within a colony occurs within about two and one-half weeks. The USFWS stipulates that surveys for the small whorled pogonia be conducted between May 25 and July 15 for Counties South of Caroline County and between June 1st, and July 20th for Caroline County and North, which is the time of year when the best conditions and most identifiable specimens persist. Studies by Ware and others since 1988 have documented dormancy periods of up to 10 years. The causes of dormancy beyond that of winter are uncertain, as are the factors that end dormancy. Factors that could induce dormancy and are currently being studied include changes in precipitation levels, climatic variations, grazing, and the surrounding canopy cover.

The small whorled pogonia is self-pollinating, and rarely produces more than one stem per plant. As flowering ends, those plants in which pollination has occurred show immediate enlargement of the ovary. The fruit reaches nearly full size by July, but it does not become ripe until the fall, often not dehiscing until the late fall. A plant that produces a large flowering stem one year may appear as a diminutive vegetative plant the following year, especially if its leaves were damaged early in the previous season. Such damage could occur from a number of causes (e.g. deer or insect browsing).

Appendix A presents photographs of the small whorled pogonia.

2.4 Species Status

The small whorled pogonia formerly occurred in 48 counties in 16 eastern states and Canada, but when federally listed it was known to exist only in 16 counties in 10 eastern states, and one county in Ontario, Canada. There are three main population centers of the small whorled pogonia: the northernmost population occurs in the foothills of the Appalachian Mountains in New England and northern coastal Massachusetts; the southern most population occurs at the

southeastern extreme of the Blue Ridge Mountains, where North Carolina, South Carolina, Tennessee, and Georgia intersect; the central population occurs in the Piedmont and Coastal Plain physiographic provinces of Virginia. Several disjoint populations occur in Delaware, New Jersey, Pennsylvania, Ohio, Michigan, Illinois, and Ontario, Canada.

The small whorled pogonia is particularly susceptible to activities that alter canopy cover or increase inter-specific competition among plants. The small whorled pogonia was listed as a federal endangered species on September 10, 1982, and was subsequently listed as a Virginia endangered species in 1985. According to the Virginia Department of Conservation and Recreation, Division of Natural Heritage, the small whorled pogonia is ranked as 0G2/S1, indicating its worldwide status as being rare and its Commonwealth of Virginia status as being extremely rare (Ware, 1991). In November 1994, the small whorled pogonia was reclassified from endangered status to threatened status. However, this reclassification does not change the level of federal protection provided for this species.

3.0 2013 Field Survey

3.1 Survey Method

The Graham Property contains approximately 300 acres of irregularly shaped cleared and wooded land, as well as an active quarry. The property is bordered by Ox Road to the east, Elk Horn Run to the west, the Occoquan River to the south, and Penniwell Road and Residential Properties to the north. The property is located in Fairfax County, Virginia (Figure 1). This investigation was completed in compliance with the USFWS time-of-year requirements between June 1 through July 20 in counties to the north of and including Caroline County.

An off-site investigation was performed first, followed by an on-site investigation. The off-site investigation was conducted by a review of the following available data:

- U.S.G.S. Topographic Maps, 7.5 Minute Quadrangles, Fort Belvoir, Virginia, 1965, Photorevised 1983, Bathymetry added 1982 and U.S.G.S. Topographic Maps Occoquan, Virginia 1956 (Photorevised 1984) Scale 1" = 2,000' (Figure 1).

- Virginia Department of Transportation Aerial Photographs of the site (various dates between 1933 through 1983.

- Aerial Photography flown 2012 provided by Vulcan

- Aerial Photography on Google Earth™, (various dates between 1988 through 2013).

On July 8th, 2015, Timmons Group Scientists conducted an intensive search of three study areas (See Figure 2), approximately 38 acres of the subject property that was identified as potential suitable habitat for small whorled pogonia. A search was conducted for suitable habitat for the small whorled pogonia by traversing contour transects spaced at approximately 25-foot intervals.

Pedestrian transects were conducted using GPS for guidance. No consideration was given to slope aspect during the investigation for small whorled pogonia, as all slopes were searched.

Study Area 1 is located in the western portion of the quarry and comprises approximately 13.2 acres. Study Area 2 is located on the southern side of the quarry and comprises approximately 11.75 acres. Study Area 3 is located on the eastern side of the quarry and comprises approximately 12.76 acres.

3.1.1 Study Area 1 (Elk Horn Run)

Study Area 1 is located along the southern edge of the active Graham Quarry pit. A berm and a fence separates the study area from the active quarry. The southern extent of the study area is bordered by Elk Horn Run which flows southwest to the Occoquan River. The powerline easement bisects the study area into a northern and southern portion as well as an eastern and western portion.
Most of the northern extent of the study area was unsuitable habitat because of the powerline easement or proximity to the active quarry. These areas are maintained by human activities and are composed of a dense understory of mountain laurel (*Kalmia latifolia*), stilt grass (*Microstegium vimineum),* carpet grass (*Axonopus fissifolius),* as well as several invasive species including tree-of-heaven (*Ailanthus altissima*). Other areas along the southern slopes to the eastern and western extent of the study area contained steep rocky slopes.

Approximately 40% of the study area was considered "suitable habitat" and consisted of a forested canopy consisting of beech oak and hickory forests with along gentle to moderately steep slopes. Understory herbs have overtaken some of the habitat, where the over story canopy becomes more open die to a fallen tree.

3.1.2 Study Area 2 (Lower Little Occoquan Run)

The Study Area 2 is a moderately to steep, sloped ravine along the Little Occoquan Run, which flows south to the Occoquan River. The north extent of the study area contains a former stormwater retention basin, where the vegetation is maintained as emergent. Slopes along the northern side of the ravine are steep and rocky, with sparse understory vegetation. The southern side of the ravine, as well as the toe of the northern side of the ravine, contains suitable habitat. These areas are mature forests comprised of tulip poplar, black oak (*Quercus nigra*), chestnut oak (*Quercus prinus*), Virginia pine (*Pinus virginiana*), sweetgum (*Liquidambar styriciflua*), and pignut hickory (*Carya glabra*) along gradual to moderately steep slopes. Understory species consisted of Christmas fern (*Polystichum acrostichoides*), rattlesnake weed (*Hieracium venosum*), and paw paw (*Asimia triloba).*

3.1.3 Study Area 3 (Upper Little Occoquan Run)

Study Area 3 appears to have been managed in a "park-like condition" either by previous human or animal activities. Based on aerial photographs, Study Area 3 had been logged as recently as 1954. By 1966, the forest community consisted of a mixed hardwood forest; however, the area

was maintained forestry and agriculture. Currently, the vegetation within this study area is "even-aged" with a mature hardwood forest and sparse herbaceous understory in areas that were considered "suitable" or "marginal" habitat".

Approximately 25% of the Study Area 3 was unsuitable habitat due to the presence of a powerline easement, wetlands, or other human disturbance activities (i.e. a created berm). Japanese stiltgrass (*Microstigeium vimineum*), an invasive species, is the dominant species along the eastern side of the stream that bisects Study Area 3. The northern extent of Study Area 3 was considered "marginal habitat" due to the area being forested, but having a sparse vegetation understory.

The remainder of the study area consisted of gentle slopes with a forested canopy of oaks, sweetgum, and red maple with an understory of New York fern (*Parathelypteris noveboracensis*), cinnamon fern (*Osmunda cinnamomea*), and jack-in-the-pulpit (*Arisaema triphyllum*).

3.2 Results

3.2.1 Study Area 1

Fifty species were identified Study Area 1 (See Appendix C). Much of the study area is well vegetated consisting of a forested ecosystem of the following species: white oak (*Quercus alba*), Virginia Pine (*Pinus virginiana*), tree-of-heaven (*Ailanthus altissima*), catalpa (*Catalpa speciosa*), northern red oak (*Quercus rubra*), tulip poplar (*Liriodendron tulipifera*), pignut hickory (*Carya glabra*), red maple (*Acer rubrum*), chestnut oak (*Quercus phellos*), tulip poplar (*Liriodendron tulipifera*) in the tree stratum; American holly (*Ilex opaca*), pawpaw (*Asimina triloba*), and mountain laurel (*Kalmia latifolia*) in the shrub strata. The herbaceous strata was comprised of lady fern (*Athyrium felix-femina*), lowbush blueberry (*Vaccinium angustifolium*), mayapple (*Podophyllum peltatum*), jack in the pulpit (*Arisaema triphyllum*), Virginia creeper (*Parthenocissus quinquefolia*), Solomon seal (*Polygonatum biflorum*), tick trefoil (*Desmodium nudiflorum*), and partridgeberry (*Mitchella repens*).

The above composition of species is consistent with second and third generation deciduous forests. However; the dense understory cover in some areas (as noted above) is inconsistent with potential documented habitat of small whorled pogonia (see attached photographs in Appendix B).

Study Area 1 was searched using controlled contour transects, where no small whorled pogonia stems were observed.

3.2.2 Study Area 2

Sixty-four species were identified in Study Area 2 (See Appendix C). The vegetation in the Study Area 2 consists of the following species: tulip poplar, black oak (*Quercus nigra*), chestnut oak, Virginia pine, sweetgum, and pignut hickory in the canopy; serviceberry (*Amelanchier*

arborea), sassafrass (*Sassafrass albidum*), mountain laurel, American holly (*Ilex opaca*) in the sapling stratum; and whorled loosestrife (*Lysimachia quinquefolia*), lowbush blueberry, Christmas fern, New York fern, spotted wintergreen (*Chimaphila maculata*), and paw paw (*Asimia triloba).*

The species composition of Study Area 2 is consistent with second and third generation deciduous forests with a moderate understory cover. Slopes range from gradual to steep. The vegetation within the habitat observed was consistent with documented habitat of the small whorled pogonia. However; some areas within Area 2 are very rocky with little or no organic "duff" layer to support the species (see attached photographs in Appendix B), which is not suitable habitat.

Study Area 2 was searched using controlled contour transects, where no small whorled pogonia stems were observed.

3.2.3 Study Area 3

Sixty species were identified in Study Area 3 (See Appendix C).

The vegetation in the Study Area 3 consists of the following species: white oak, Virginia Pine, northern red oak, tulip poplar, red maple, in the tree stratum; American holly, pawpaw, and blackhaw (*Viburnum prunifolium*) in the shrub strata. The herbaceous strata was comprised of lady fern (*Athyrium felix-femina*), lowbush blueberry (*Vaccinium angustifolium*), and Virginia creeper (*Parthenocissus quinquefolia*).

The above composition of species is consistent with second and third generation deciduous forests. However; the understory vegetation was sparse indicating too much shade for small whorled pogonia or the past use and anthropogenic manipulation of this area has created a sterile environment (see attached photographs in Appendix B).

Study Area 3 was searched using controlled contour transects, where no small whorled pogonia stems were observed.

4.0 Summary

- Outside of Study Areas 1 and 2 and 3, vegetation generally consisted of the active quarry and areas of few trees, fields, powerline easements, roads, wetlands or a very thick stratum of saplings and thick ground cover. These areas do not contain suitable small whorled pogonia habitat.

- Within Study Areas 1, 2, and 3, forested areas were considered "suitable" to "marginal" habitat. Areas of marginal habitat consisted of dense or sparse understory vegetation, large shaded areas, steep slopes. All areas within the study areas were intensively surveyed for small whorled pogonia.

- The 2013 field survey on the Graham property found no small whorled pogonia stems within the three areas surveyed.
- Timmons Group respectfully requests confirmation of the findings in this report from your office.

5.0 References

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2015 Small Whorled Pogonia Field Survey
Graham Property
Vulcan Construction Materials, LP.
Fairfax County, Virginia

Scientific Name	**Common Name**	**Stratum**	**Area 1**	**Area 2**	**Area 3**
Acer rubrum	Maple, Red	T, S, H	**x**	**x**	**x**
Actaea racemosa	Black Bugbane	H		**x**	
Ailanthus altissima	Tree-of-Heaven	SS	**x**		
Alnus serrulata	Hazel Alder	SS	**x**	**x**	**x**
Amelanchier arborea	Serviceberry	SS	**x**	**x**	**x**
Apocynum cannabinum	Indian Hemp	H	**x**		
Aralia spinosa	Devil's Walkingstick	SS	**x**		
Asclepias purpurascens	Milkweed, Purple	H	**x**		
Asimina triloba	Pawpaw	SS		**x**	**x**
Asplenium platyneuron	Ebony Spleenwort	H		**x**	**x**
Athyrium filix-femina	Fern, Lady	H	**x**	**x**	**x**
Botrychium biternatum	Grapefern	H		**x**	**x**
Campsis radicans	Creeper, Trumpet	V	**x**	**x**	**x**
Carpinus caroliniana	Musclewood	SS	**x**	**x**	**x**
Caryx spp.	Sedge	H			**x**
Catalpa bignonioides	Catalpa	T	**x**	**x**	**x**
Cercis canadensis	Redbud	SS			**x**
Chasmanthium latifolium	Indian Wild Oats	H	**x**	**x**	**x**
Chimaphila maculata	Wintergreen, Spotted	H	**x**	**x**	**x**
Cornus florida	Dogwood	T		**x**	
Dioscorea villosa	Yam, Wild	H	**x**	**x**	**x**
Duchesnea indica	Strawberry, Wild	H	**x**	**x**	**x**
Elaeagnus angustifolia	Russian Olive	S		**x**	
Fagus grandifolia	American Beech	T	**x**	**x**	**x**
Fraxinus pennsylvanica	Ash, Green	T		**x**	
Galium pilosum	Bedstraw	H		**x**	**x**
Hieracium gronovii	Hawksweed	H		**x**	
Ilex opaca	American Holly	SS	**x**	**x**	**x**
Juglans nigra	Walnut, Black	T		**x**	
Juncus effusus	Rush, Common	H	**x**		
Juniperus virginiana	Cedar, Red	SS		**x**	**x**
Kalmea latifolia	Mountain Laurel	SS	**x**	**x**	
Lespedeza cuneata	Lespedeza	H		**x**	**x**
Ligustrum sinense	Privet	H			**x**
Liquidambar styraciflua	Sweetgum	T	**x**	**x**	**x**
Liriodendron tulipifera	Tulip Poplar	T	**x**	**x**	**x**
Lonicera japonica	Honeysuckle, Japanese	H,V		**x**	**x**
Lysimachia quadrifolia	Loosestrife, Whorled	H		**x**	
Magnolia virginiana	Magnolia, Sweetbay	SS		**x**	
Maianthemum racemosum	False Solomons Seal	H	**x**	**x**	**x**
Medeola virginiana	Cucumber Root	H	**x**	**x**	**x**

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Microstigium	Japanese Stilt-Knot	H	**x**		
Monotropa uniflora	Indian Pipe	H			**x**
Nyssa sylvatica	Blackgum	T		**x**	
Osmunda cinnamomea	Fern, Cinnamon	H	**x**	**x**	**x**
Osmunda regalis	Fern, Royal	H	**x**	**x**	**x**
Oxalis violacea	Sorrel, Wood	H		**x**	**x**
Panicum dichotomoflorum	Deertongue Grass	H	**x**	**x**	**x**
Panicum virgatum	Switchgrass	H	**x**		
Parthenocissus quinquefolia	Creeper, Virginia	H	**x**	**x**	**x**
Phytolacca americana	Pokeweed	H		**x**	
Pinus virginiana	Pine, Virginia	T,H	**x**	**x**	**x**
Plantago major	Common Plantain	H		**x**	**x**
Platanus occidentalis	Sycamore, American	T	**x**		
Polygonum sagittatum	Lady Tear-Thumb	H	**x**	**x**	**x**
Polystichum acrostichoides	Fern, Christmas	H	**x**	**x**	**x**
Potentilla canadensis	Cinquefoil	H	**x**	**x**	**x**
Prunus serotina	Black Cherry	T		**x**	**x**
Quercus alba	Oak, White	T	**x**	**x**	**x**
Quercus nigra	Oak, Willow	T	**x**	**x**	**x**
Quercus rubra	Oak, Northern Red	T	**x**	**x**	**x**
Rhododendron periclymenoides	Azalea, Wild	SS			**x**
Rubus idaeus	Raspberry	V,H	**x**	**x**	**x**
Sassafras albidum	Sassafras	SS		**x**	**x**
Securigera varia	Crown Vetch	H	**x**		
Sisyrinchium fuscatum	Blue-Eyed Grass	H			**x**
Smilax rotundifolia	Greenbrier	V,H	**x**	**x**	**x**
Solanum carolinense	Horsenettle	H	**x**		
Stellaria media	Chickweed	H		**x**	**x**
Thalictrum thalictroides	Anemone, Rue	H		**x**	**x**
Thelypteris noveboracensis	New York Fern	H		**x**	**x**
Toxicodendron radicans	Ivy, Poison	V	**x**	**x**	**x**
Urtica dioica	Nettle, Stinging	H	**x**		
Vaccinium angustifolium	Blueberry, Lowbush	H	**x**	**x**	**x**
Verbascum thapsus	Mullen, Common	H	**x**	**x**	**x**
Viburnum prunifolium	Blackhaw	SS	**x**		**x**
Viola spp.	Violet	H	**x**	**x**	**x**
Vitis labrusca	Grape, Fox	V	**x**	**x**	
Microstigium vimineum	Stilt Grass		**x**		
Axonopus fissifloius	Carpet Grass		**x**		

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YOUR VISION ACHIEVED THROUGH OURS

Site Development | Residential | Infrastructure | Technology | Environmental

DATE	REVISION DESCRIPTION

DATE 07/07/2015
DRAWN BY B. NORRIS
DESIGNED BY D. COX
CHECKED BY J, BROOKS
SCALE 1" = 700'

TIMMONS GROUP

VULCAN - GRAHAM QUARRY

FAIRFAX COUNTY, VIRGINIA

AERIAL

JOB NUMBER TBD
SHEET NO. 1 OF 1

Vulcan Construction Materials, LLC
Graham II Quarry Mineral Reserve Extraction
Fairfax County, Virginia
Joint Permit Application (JPA)

CULTURAL RESOURCES

On June 17, 2015, a database search was performed for archaeological or cultural resources in the vicinity of the proposed project.

Using the Virginia Department of Historical Resources (DHR) Virginia Cultural Resource Information System (V-CRIS), the attached map was generated indicating that architectural and thirteen (13) archaeological resources are located within and immediately adjacent to the project site.

According to "Phase I Archaeological Investigations at the Proposed 83 Acre Vulcan Quarry Expansion Area, Fairfax County, Virginia" performed by others, dated March 1997, the majority of cultural resource have either been destroyed or are located outside of the project area. The Phase I study addressed eight archaeological resources identified by the DSS (44FX 1037 to 44FX1043 and 44FX1052). According to the Phase I, seven of these sites do not warrant additional work due to their lack of historical significance. However, there was a relatively dense lithic scatter (quartz flecks) found at the 44FX1033 site located on the floodplain of Elk Horn Run, making this particular site potentially significant. However the site is located within the planned riparian buffer and will not be impacted by the proposed quarry expansion. Therefore, no further recommendations were made. .A copy of the VDHR files and previous Phase I report (VDHR File No. 96-1503) are enclosed.

Other resources not covered in the Phase I study include 44FX 2239 and 44FX2240, as well as 44FX2800 and 44FX2801, both of which were destroyed. The lone architectural site is VDHR File No. 029-0221 which was the Women's Division Occoquan Workhouse that was demolished for the construction of the Griffith Water Treatment Plant (see enclosed Cultural Resources Evaluation on the Grounds of the Former Medium Security Facility District of Columbia Detention Center Lorton, Virginia by The Cultural Resources Group, Louis Berger & Associates, Inc., May 1998).

Therefore, there are no anticipated cultural resource impacts associated with the proposed project. However, in accordance with permit conditions, if any previously unknown cultural resources are encountered during construction activities, Vulcan will contact the United States Army Corps of Engineers – Norfolk District, in order to initiate Federal and State coordination.